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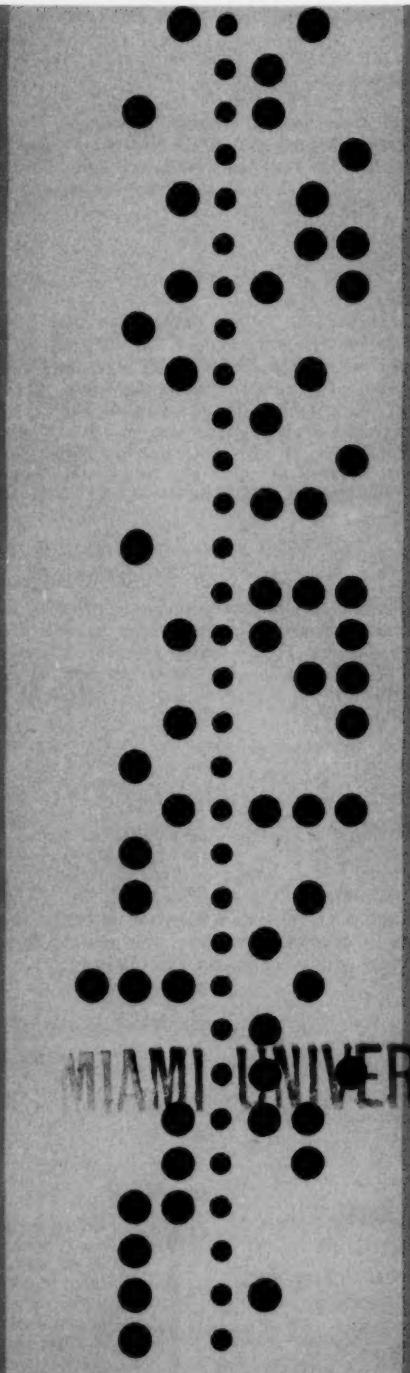
February 25, 1966

U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS



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Semi-Monthly Journal

- *Abstracts of R & D Reports*
- *List of Current R & D Projects*
- *Indexes*

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U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

February 25, 1966 / Volume 41, Number 4

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

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PURPOSE

U.S. Government Research & Development Reports announces the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense, the Atomic Energy Commission, National Aeronautics & Space Administration, and other agencies. It also lists current Government-sponsored R&D projects.

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NASA and AEC documents announced in this publication are also abstracted—along with other mission-oriented material—in the NASA journal *Scientific and Technical Aerospace Reports*, and the AEC journal *Nuclear Science Abstracts*. These publications are sold on subscription by Superintendent of Documents: *STAR* at $33 a year ($9 additional for foreign mailing); *NSA* at $30 a year ($7 additional for foreign mailing).

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Contents may be printed freely. Mention of source will be appreciated. Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

special ANNOUNCEMENTS

NASA TECH BRIEFS FOR 1966 TO BE ISSUED AS PUBLISHED

NASA Tech Briefs may be purchased on an annual subscription basis in five categories at $20 a year. They are also available at 15 cents each. Subscriptions are on a calendar year basis beginning in January and subscribers who order later in the year will receive back issues from January. Prices for individual category subscriptions are:

Electrical-Electronic	$6.00
Energy Sources	2.50
Materials	5.00
Life Sciences	2.50
Mechanical	6.00

Tech Briefs for 1965 are still available at a price of $20 for all categories, or by individual categories at the prices shown above. All Tech Briefs issued in 1964 (221 total in all categories) may be purchased at a special price of $10.

PUBLICATION DATES CHANGED

Beginning with this issue, the publication dates have been changed from the 5th and 20th of each month to the 10th and the 25th.

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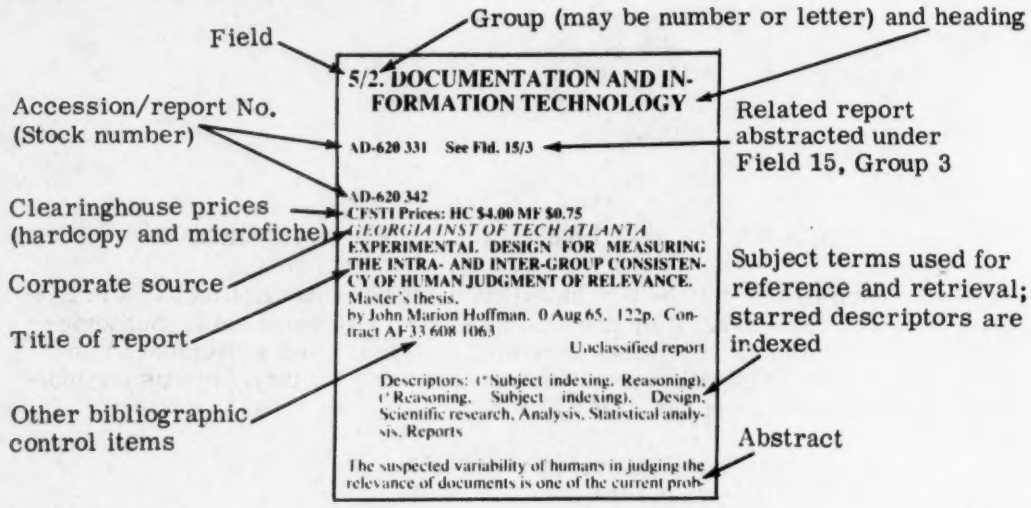
Entries are arranged under 22 subject categories called FIELDS. In the "Technical Abstract Bulletin" section, FIELDS are divided into sub-categories called GROUPS and occasionally subgroupings are also used. Documents are listed alpha-numerically (that is, alphabetic data precedes numerical data) by accession/report number. Although differing slightly in printing format, entries in the various sections contain essentially the same information.

- TECHNICAL ABSTRACT BULLETIN
- OTHER RESEARCH REPORTS


Field
Group (may be number or letter) and heading
5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY
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AD-620 342
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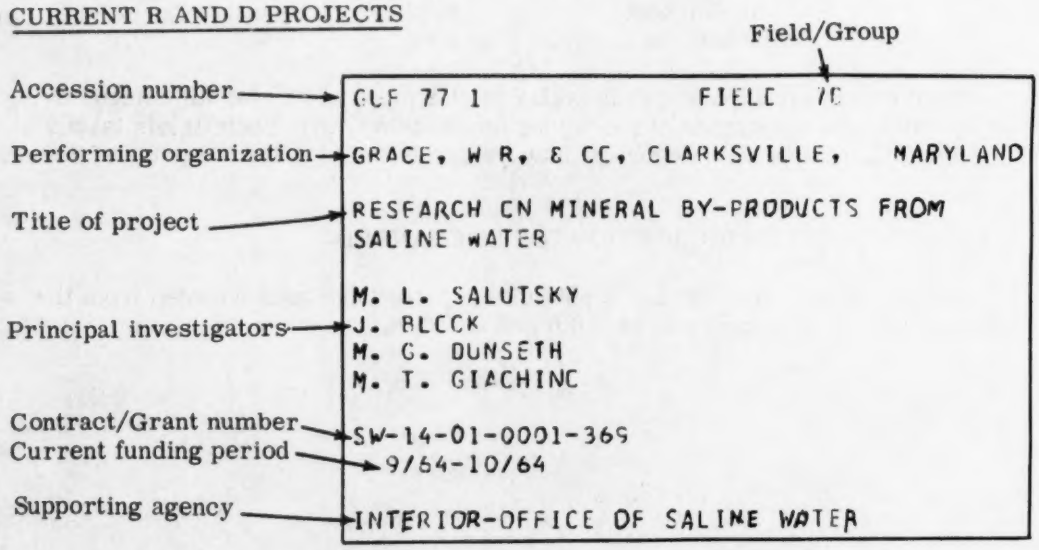
Title of report
EXPERIMENTAL DESIGN FOR MEASURING THE INTRA- AND INTER-GROUP CONSISTENCY OF HUMAN JUDGMENT OF RELEVANCE.
Master's thesis,
by John Marion Hoffman. 0 Aug 65. 122p. Contract AF33 608 1063
Subject terms used for reference and retrieval; starred descriptors are indexed
Unclassified report
Other bibliographic control items
Descriptors: (*Subject indexing, Reasoning), (*Reasoning, Subject indexing), Design, Scientific research, Analysis, Statistical analysis, Reports
Abstract
The suspected variability of humans in judging the relevance of documents is one of the current prob-

- CURRENT R AND D PROJECTS



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SUBJECT CATEGORY HEADINGS

01	AERONAUTICS	1, S-1
	Includes aerodynamics; aeronautics; aircraft; aircraft flight control and instrumentation; and air facilities.	
02	AGRICULTURE	3, S-1
	Includes agricultural chemistry; agricultural economics; agricultural engineering; agronomy and horticulture; animal husbandry; and forestry.	

03 ASTRONOMY AND ASTROPHYSICS 3, S-2

Includes astronomy; astrophysics; and celestial mechanics.

04 ATMOSPHERIC SCIENCES 5, S-3

Includes atmospheric physics and meteorology.

05 BEHAVIORAL AND SOCIAL SCIENCES 12, S-5

Includes administration and management; documentation and information technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology.

06 BIOLOGICAL AND MEDICAL SCIENCES 19, S-6

Includes biochemistry; bioengineering; biology; bionics; clinical medicine; environmental biology; escape, rescue, and survival; food; hygiene and sanitation; industrial (occupational) medicine; life support; medical and hospital equipment and supplies; microbiology; personnel selection and maintenance (medical); pharmacology; physiology; protective equipment; radiobiology; stress physiology; toxicology; and weapon effects.

07 CHEMISTRY 36, S-10

Includes chemical engineering; inorganic chemistry; organic chemistry; physical chemistry; and radio and radiation chemistry.

08 EARTH SCIENCES AND OCEANOGRAPHY 47, S-12

Includes biological oceanography; cartography; dynamic oceanography; geochemistry; geodesy; geography; geology and mineralogy; hydrology and limnology; mining engineering; physical oceanography; seismology; snow, ice, and permafrost; soil mechanics; and terrestrial magnetism.

09 ELECTRONICS AND ELECTRICAL ENGINEERING 56, S-13

Includes components; computers; electronic and electrical engineering; information theory; subsystems; and telemetry.

10 ENERGY CONVERSION (Non-Propulsive) 69, S-18

Includes conversion techniques; power sources; and energy storage.

11 MATERIALS 71, S-18

Includes adhesives and seals; ceramics, refractories, and glasses; coatings, colorants, and finishes; composite materials; fibers and textiles; metallurgy and metallography; miscellaneous materials; oils, lubricants, and hydraulic fluids; plastics; rubbers; solvents, cleaners, and abrasives; and wood and paper products.

12 MATHEMATICAL SCIENCES 76, S-20

Includes mathematics and statistics and operations research.

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING 80, S-21

Includes air conditioning, heating, lighting, and ventilating; civil engineering; construction equipment, materials, and supplies; containers and packaging; couplings, fittings, fasteners, and joints; ground transportation equipment; hydraulic and pneumatic equipment; industrial processes; machinery and tools; marine engineering; pumps, filters, pipes, tubing, fittings, and valves; safety engineering; and structural engineering.

14 METHODS AND EQUIPMENT 85, S-25

Includes cost effectiveness; laboratories, test facilities, and test equipment; recording devices; reliability; and reprography.

15 MILITARY SCIENCES 89

Includes antisubmarine warfare; chemical, biological, and radiological warfare; defense; intelligence; logistics; nuclear warfare; and operations, strategy, and tactics.

16 MISSILE TECHNOLOGY 91

Includes missile launching and ground support; missile trajectories; missile warheads and fuzes; and missiles.

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES 91, S-27

Includes acoustic detection; communications; direction finding; electromagnetic and acoustic countermeasures; infrared and ultraviolet detection; magnetic detection; navigation and guidance; optical detection; radar detection; and seismic detection.

18 NUCLEAR SCIENCE AND TECHNOLOGY 95, S-27

Includes fusion devices (thermonuclear); isotopes; nuclear explosions; nuclear instrumentation; nuclear power plants; radiation shielding and protection; radioactive wastes and fission products; radioactivity; reactor engineering and operation; reactor materials; reactor physics; reactors (power); reactors (non-power); and SNAP technology.

19 ORDNANCE 96, S-39

Includes ammunition, explosives; bombs; combat vehicles; explosions, ballistics, and armor; fire control and bombing systems; guns; rockets; and underwater ordnance.

20 PHYSICS 97, S-39

Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation.

21 PROPULSION AND FUELS 129, S-47

Includes air-breathing engines; combustion and ignition.

22 SPACE TECHNOLOGY 130, S-48

Includes astronautics; spacecraft; spacecraft trajectories and reentry; and spacecraft launch vehicles and ground support.

RESEARCH highlights

Reports of current high industrial interest

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Plastics

DATA GATHERED ON ELECTRICAL PROPERTIES OF PLASTICS

(Order Stock No. AD-624 922 Electrical Properties of Plastics: Data Compiled From Technical Conference Search, HC $5.00/MF $1.00.)

A tremendous output of data on electrical properties of plastic materials complicates the problem of keeping aware of new developments, using new materials, avoiding unnecessary duplications in testing, and shortening the time between development and application. In an effort to help the worker in plastics stay abreast of his field, the Army's Plastics Technical Evaluation Center has compiled data from 1600 papers presented at 49 conferences between March 1960 and March 1965. The report contains information on acrylate-ethylene copolymer, acrylic, alkyd, allylic, diphenyl oxide, epoxy, ethylene-vinyl acetate, fluorocarbon, ionomer, melamine, phenolic, polyamide, polycarbonate, polyester, polyether, polyethylene, polyimide, polyphenylene oxide, polypropylene, polystyrene, polyurethane, silicone, urea formaldehyde, and the vinyls. This information is useful in the making of insulators, process control, degradation and polymerization studies, research on properties versus structure, and studies of environmental effects. As additional data becomes available it can be added to form a continuing up-to-date body of information. As a result, says PLASTEC, considerable searching time and money can be saved.

Electronics

THE NAVY'S MICROELECTRONICS PROGRAM DESCRIBED

(Order Stock No. AD-625 007 Navy Microelectronics Program, HC $6.00/MF $1.50.)

Proceedings of the third Navy conference on microelectronics contains papers describing R and D programs of the Office of Naval Research, the Bureau of Ships, and the Bureau of Naval Weapons. A special section on instrumentation describes current work in bio-telemetry, animal telemetry, medicine, oceanography, and space. Work in microelectronics has advanced so rapidly that the Navy foresees the day "when not only the fabrication and production handling processes are automated, but they are tied into computer process design data in such a way that one feeds the desired functional transfer characteristics of a device into the computer, and the prototype device comes out the end of the laboratory pilot production line for testing, complete with production process specifications data."

Engineering and Construction

ON-SITE PLASTIC BEACH MATTING FABRICATION

(Order Stock No. AD-623 952 Feasibility Study of On-Site Fabricated Beach Matting, HC $3.00/MF $0.75.)

A feasibility study of on-site fabricated beach matting carried out for the Marine Corps by Support Systems of Boeing concludes that reinforced polyesters possess the required strength characteristics and can be sprayed on beaches to replace the bulky, heavy, and costly steel matting. It is possible to adjust the curing characteristics of the compound at various ambient temperatures by changing the amount of promotor. A combination of polyester reinforced with 19 to 32 percent chopped fiberglass can withstand a 10,000 pound wheel load imposed on it. Two pounds per square foot of the surfacing material should be applied for the preparation of the beach matting.

Human Factors Engineering

HOW COLD STRESS AFFECTS HUMANS

(Order Stock No. AD-624 044 Cold Stress: Parameters, Effects, Mitigation, HC $1.00/MF $0.50.)

A review of cold stress literature performed for the Air Force by Texas Christian University looks into the mechanisms of body temperature control under cold exposure. The behaviorial investigators review how task performance, morale, and body condition deteriorate under cold stress and what can be done as supportive and protective measures. The researchers note that deterioration of many facets of human behavior and condition take place under cold stress, but they also conclude that given good motivation and morale, tolerance levels are greater for many individuals.

Coatings

YTTRIUM ALLOY FOR CLADDING APPLICATIONS

(Order Stock No. APEX-681 Iron-Chromium-Aluminum-Yttrium Alloys for Cladding Applications to 2400°F, HC $2.00/MF $0.50.)

As a nuclear fuel element cladding material, the alloy Y-25Fe-4Cr-1Al is unexcelled to temperatures of 2400°F, General Electric reports. At elevated temperatures, the oxidation is stable and thermally shock resistant. GE has determined optimum composition, procedures for melting, casting, and working the alloy to useful shapes, mechanical properties, and oxidation resistance to 2500°F. When used as a 0.010-inch-thick cladding in unstressed conditions, the alloy can resist oxide penetration for well over 2,000 hours at 2300°F, 1,000 hours at 2400°F, 500 hours at 2450°F, and 300 hours at 2500°F.

Lubricants

MOLYBDENITE TESTED IN CONTROLLED ATMOSPHERE

(Order Stock No. AD-623 484 Fundamental Investigation of Molybdenum Disulfide as a Solid Lubricant, HC $3.00/MF $0.75.)

A basic test facility for performing compression, tension, torsion, cohesion, adhesion, and sliding experiments on cylindrically shaped molybdenum disulfide specimens in a controlled atmosphere has been put into operation for the Navy by Southwest Research Institute. Tests on the MoS_2 show that compact hardness provides a good measure of compact specific gravity. Good mechanical integrity, homogeneity of specific gravity and hardness, and good compressive strength are noteworthy of explosively formed lubricant. It appears, says SRI, that explosively formed MoS_2 compacts made without the use of a binder can be used in making bearings for carrying a significant compressive load.

ELASTIC ORIFICE MAY PERMIT WIDE USE OF GAS-LUBRICATED BEARINGS

(Order Stock No. N65-34226 Elastic Orifices for Gas Bearings, HC $0.20/MF $0.50.)

Development of the elastic orifice as a means of flow control may revolutionize the field of bearing design, Stanford Research Institute reports in a NASA-supported study. Results obtained by NASA in preliminary experiments indicate the elastic orifice may permit extensive use of gas-lubricated bearings in applications formerly restricted to pressurized liquid and rolling contact bearings. The use of an elastic orifice in a test bearing demonstrated a threefold increase in bearing stiffness over a conventional fixed orifice when the two were compared at a common operating point. The increase bearing stiffness opens up the possibility of applications in machine tool components, expecially grinding spindles, and for instrument design where operations require frequent starting and stopping. Such bearings are also potentially applicable for pivot support of instruments such as the gimbal axis of gyros and precision balances.

Metals, Non-Ferrous and Alloys

TUNGSTEN ALLOY FOR HIGH TEMPERATURE APPLICATIONS

(Order Stock No. N65-32648 Tungsten-Nickel-Copper Ternary Alloys for High-Temperature Applications, HC $1.00/MF $0.50.)

By alloying tungsten with copper and nickel, NASA's Lewis Research Center may have developed the long-sought-for tungsten material with useful strength at temperatures over 3000°F. It also has the capability for accelerated sintering at significantly lower temperatures and shorter times than currently possible with pure tungsten. The W-0.3Ni-0.2Cu ternary alloy exhibits strength and ductility comparable to wrought/recrystallized powder-metallurgy and arc-cast tungsten at temperatures of about 3000 to 4000°F, while retaining sintering capacity at temperatures as low as 2200°F. Elongation values for the new alloy are comparable to values normally shown for recrystallized tungsten over the temperature interval of 3000 to 4000°F. Heat treatment of the alloy following sintering increases the elongation before fracture at 3000°F from 4.0 to 20.0 percent with little loss of strength. In the heat treated condition the alloy can be rolled to a 50-percent reduction in thickness at about 3000°F. The rolled material compares favorably with conventional, unalloyed, worked tungsten sheet material.

Nuclear Technology

SINGLE AND DUAL WATER COOLED REACTOR POWER PLANTS

(Order Stock No. NYO-3289-1 Comparative Evaluation of Single and Dual Water Cooled Reactor Power Plants, HC $3.00/MF $0.75.)

A comparative evaluation of single and dual water cooled reactor power plants carried out for the AEC by Nuclear Utility Services concludes that there are only small differences in costs between such reactor plants. The contractor therefore recommends that bids on both single and dual reactor plants be solicited when an electric utility considers installation of a nuclear plant, particularly if the total power output is around 300 - 500 MWe. Cost evaluation was made for capital expenditure, fuel cycle, operations, and plant availability for three reactor designs -- pressurized water reactor with chemical shim control, pressurized water reactor with spectral shift control, and boiling water reactor.

Optics

SURVEY OF EXISTING TELESCOPES

(Order Stock No. N65-34503 Preliminary Considerations for Optical Telescopes for Lunar Surface Use, HC $2.00/MF $0.50.)

A survey of existing telescopes carried out by NASA's George C. Marshall Space Flight Center discusses catadioptric types, mounting considerations, telescope usability, parts and materials, telescope size, and minimal dome designs. NASA engineers see the possibility of scanning the planets, stars, galaxies, and nebulae from the moon, and propose a 21-inch porthole folded-optics telescope as practical and of reasonable size for an early lunar mission. The design was chosen to provide maximum spectral coverage in ultraviolet and infrared. It will give a 50 percent decrease in resolution over current earth-based instruments, and powers up to 1050 are possible. The complete package should not exceed 300 pounds.

Power Source Devices

BANANA USED AS SOURCE OF ELECTRIC POWER

(Order Stock No. AD-622 719 Biochemical Fuel Cell, HC $4.00/MF $0.75.)

The common banana became a source of electric power with the recent development of a hydrogen-oxygen ion exchange membrane fuel cell. Developed by Melpar for the Army, the device far exceeds initial expectations and produces 3.5 to 3.7 watts (0.76 volts, 4.92 amperes) of electricity continually for 24 hours. It uses a hydrogen generation system having a 20-liter fermentation mixture of microorganisms, inorganic salt solution, and bananas. The experiment showed that Cl. welchii is the best microorganism to use, and that glucose or maltose are the preferable substrates. Melpar says that squash, grapes, and almost any fruit may be substituted for bananas in the hydrogen production. The microbial hydrogen generator has the potential of continuous power in the kilowatt range by scale-up and perfection of the system, Melpar says. It has logistic advantages over other power sources now being used in remote areas, and offers a new possibility to industries engaged in the disposal of many agricultural waste products.

IMPROVED SOLAR CONVERTERS

(Order Stock No. AD-622 267 Modular Design of Improved Solar Converters, HC $4.00/MF $0.75.)

Improved solar converters of modular design for use in areas where conventional power is impractical or unavailable offer compactness, simplicity, ability to be quickly set up, and ease of operation, according to Hamilton Standard in an Army-sponsored study. The array can be set up and be in full power operation in approximately one minute, and it can be folded and ready for transportation just as quickly. Output power levels from 5 to 25 watts in 5 watt increments can be changed in a matter of seconds. A carrying case is an integral part of the array assembly and serves the multiple function of carrying, protecting, and supporting the solar cell modules, as well as housing and supporting the mounting and orienting devices. A quick action flip-up sun sight is provided.

Transportation (Land, Sea, Air, Space)

CRASHWORTHY DESIGN PRINCIPLES

(Order Stock No. AD-623 575 Crashworthy Design Principles, HC $3.00/MF $0.75.)

A design guide to improve chances of survival in moderate to severe aircraft crashes has been developed for FAA by General Dynamics. They recommend a fuselage bending strength that will withstand the bending moment produced by nose crushing because compression in the upper shell is usually critical. They also recommend the dispersal of the lower fuselage bending materials over a number of widely spaced elements to retain bending strength should there be partial failure or collapse of the lower shell. The passenger floor structure should be built to retain its strength after

the fuselage below it has been crushed or ruptured. Ductile materials with high tear resistance should be used in the lower fuselage. Materials with friction sparking characteristics should be avoided in areas subject to ground contact, and containment principles should be applied to fuel tanks. Thick skin construction will increase burn-through time in case of post-crash fire. The engineers favor ductile seat construction to allow plastic, energy absorbing collapse at occupant decelerations above those now required. After collapse, the seat should remain attached to the airframe and be capable of restraining the occupant for longitudinal decelerations of up to 12g. The structure around doors should be overstrength to minimize jamming, and an emergency lighting system should be provided that will operate regardless of other damage.

Management Control, Decision Systems

DOD LOGISTICS RESEARCH CONFERENCE PAPERS

Proceedings of the first Department of Defense logistics research conference are now available from the Clearinghouse. Attended by 135 persons from Government, universities, and nonprofit research organizations, this 1965 meeting focused on the more significant problems of management and the implementation of research findings in logistics. Present plans call for another conference this year, at which time DoD officials hope to open the door to members of private industry. To order these documents use the general title Proceedings of Logistics Research Conference. The proceedings are in three volumes, with volume two consisting of nine parts. They may be ordered singly or as a group, according to the stock numbers and prices quoted below.

Volume I, Opening General Session, Stock No. AD-617 791, HC $5.00/MF $1.00.

Volume II, Panel I On Logistics Planning Elements, Stock No. AD-623 382, HC $4.00/MF $1.00.

Volume II, Panel 2 On Procurement Practices, Stock No. AD-623 226, HC $3.00/MF $0.75.

Volume II, Panel 3 On Government/Industry Development and Production, Stock No. AD-623 227, HC $6.00/MF $1.25.

Volume II, Panel 4 On Practical Inventory Theory, Stock No. AD-623 228, HC $6.00/MF $1.25.

Volume II, Panel 5 On Maintenance and Repair Concepts, Stock No. AD-623 229, HC $6.00/MF $1.25.

Volume II, Panel 6 On Logistics Information Systems, Stock No. AD-623 230, HC $4.00/MF $0.75.

Volume II, Panel 7 On Cost Effectiveness Models and Evaluation, Stock No. AD-623 232, HC $5.00/MF $1.00.

Volume II, Panel 8 On Measurement of Logistics Performance/Effectiveness, Stock No. AD-623 232, HC $5.00/MF $1.00.

Volume II, Panel 9 On Logistics Simulation, Stock No. AD-623 233, HC $5.00/MF $1.00.

Volume III, Abstracts of Panel Papers, Stock No. AD-623 234, HC $4.00/MF $0.75.

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CURRENT research & development PROJECTS

01. Aeronautics

ZKD 17 1 FIELD 1B, 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES IN SUPPORT OF AIRPORT DESIGN AND OPERATIONS - OPERATIONS ANALYSIS AND RESEARCH TO SUPPORT AIRPORT DESIGN AND OPERATION

. NONE

FAA-RD-206-2-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 18 1 FIELD 1B, 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES IN SUPPORT OF AIRPORT DESIGN AND OPERATIONS - DEVELOP INSTRUMENTATION NEEDED FOR ENVIRONMENTAL SUPPORT OF AIRPORT OPERATIONS

. NONE

FAA-RD-206-2-E
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FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 19 1 FIELD 1C, 1B,17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ENVIRONMENTAL ASPECTS OF SUPERSONIC OPERATING PROBLEMS - METEOROLOGICAL FACTORS AFFECTING SUPERSONIC AIRCRAFT DESIGN AND OPERATION

. NONE

FAA-RD-206-3-R
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FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 30 1 FIELD 11G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FUEL CONTAINMENT UNDER SURVIVABLE CRASH CONDITIONS - STRUCTURAL DESIGN FOR FUEL CONTAINMENT UNDER SURVIVABLE CRASH CONDITIONS

. NONE

FAA-RD-311-1-R
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FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 31 1 FIELD 11G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FUEL CONTAINMENT UNDER SURVIVABLE CRASH CONDITIONS - FIXED WING CRASH RESISTANT FUEL SYSTEMS

. NONE

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FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 35 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES OF CRASH FIRE PROBLEM - STUDIES OF EMERGENCY LANDING FIRE PREVENTION PROCEDURES

. NONE

FAA-RD-311-4-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 36 1 FIELD 21B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CRASH FIRE IGNITION SUPPRESSION SYSTEMS FOR LARGE AIRCRAFT

. NONE

FAA-RD-311-6-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 37 1 FIELD 7D,21D,11G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CRASHWORTHY INTEGRAL FUEL CELLS

. NONE

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FAA-SYSTEMS RES + DEVEL SERVICE

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US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INTEGRITY OF AIRFRAMES STRUCTURE UNDER CRASH CONDITIONS - CRASHWORTHY DESIGN PRINCIPLES STUDY

. NONE

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FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 40 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INTEGRITY OF AIRFRAMES STRUCTURE UNDER CRASH CONDITIONS - INTEGRITY OF AIRFRAME STRUCTURE UNDER CRASH CONDITIONS

. NONE

FAA-RD-312-2-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 41 1 FIELD 13F

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DYNAMIC TESTING OF AIRCRAFT SEATS

NONE

FAA-RD-312-4-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 42 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVEMENTS IN GROUND OPERATION OF AIRCRAFT - RUNWAY SURFACE TRACTION MEASURING SYSTEM

. NONE

FAA-RD-313-1-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 43 1 FIELD 1A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVEMENTS IN GROUND OPERATION OF AIRCRAFT - STUDY OF ZERO BRAKING STOPPING METHODS

. NONE

FAA-RD-313-1-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 44 1 FIELD 1A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVEMENTS IN GROUND OPERATION OF AIRCRAFT - PERFORMANCE CHARACTERISTICS OF PROTOTYPE TRACTION MEASURING SYSTEMS

. NONE

FAA-RD-313-1-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 45 1 FIELD 13F

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES OF LOADS MEASUREMENTS - VGH STUDIES

. NONE

FAA-RD-314-1-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 46 1 FIELD 11G,11C,13H

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVED WINDSHIELD VISIBILITY - BETTER WINDSHIELD VISIBILITY DURING PRECIPITATION

. NONE

FAA-RD-314-2-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

206-320 O - 66 - 8

ZKD 47 1 FIELD 11G,11C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVED WINDSHIELD VISIBILITY - D EGRADATION LIMITS OF PLASTIC WINDSHIELDS IN-SERVICE

. NONE

FAA-RD-314-2-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 48 1 FIELD 11B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

WINDSHIELD STRUCTURAL REQUIREMENTS - D EVELOPMENT OF CRITERIA FOR SUBSONIC WINDSHIELD DESIGN

. NONE

FAA-RD-314-3-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 49 1 FIELD 11B,11G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

WINDSHIELD STRUCTURAL REQUIREMENTS - E STABLISHMENT OF STANDARD PROCEDURES FOR IMPACT TESTING AIRCRAFT WINDSHIELDS

. NONE

FAA-RD-314-3-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 50 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STRUCTURAL AND MECHANICAL INTEGRITY CRITERIA FOR V/STOL AIRCRAFT

. NONE

FAA-RD-314-7-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 51 1 FIELD 13F

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STABILITY OF STRUCTURE FOLLOWING BIRD STRIKE - STRUCTURAL STABILITY AFTER BIRD STRIKE

. NONE

FAA-RD-314-8-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 52 1 FIELD 21B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF ENGINE FIRE EXTINGUISHING SYSTEMS OF NEW AIRCRAFT

. NONE

FAA-RD-321-10-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 53 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DESIGN AND EVALUATION OF FIRE EXTINGUISHER SYSTEMS - DEVELOP CRITERIA FOR THE DESIGN AND EVALUATION OF AIRCRAFT ENGINE FIRE EXTINGUI

. NONE

FAA-RD-321-12-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 58 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INVESTIGATION OF BIRD INGESTION - I NVESTIGATION OF BIRD INGESTION BY AIRCRAFT ENGINES

. NONE

FAA-RD-326-2-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 60 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CARGO COMPARTMENT FIRE PROTECTION CRITERIA

. NONE

FAA-RD-331-5-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 61 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

BOMB OR EXPLOSIVE DETECTORS AND COUNTERMEASURES TECHNIQUES FOR AIRCRAFT - DEVELOPMENT OF A DEVICE TO DETECT CONCEALED EXPLOSIVES

. NONE

FAA-RD-331-16-E-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 62 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

BOMB OR EXPLOSIVE DETECTORS AND COUNTERMEASURES TECHNIQUES FOR AIRCRAFT

. NONE

FAA-RD-331-16-E-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 63 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

BOMB OR EXPLOSIVE DETECTORS AND COUNTERMEASURES TECHNIQUES FOR AIRCRAFT - EXPERIMENTAL TESTING OF EXPLOSIVE DETECTION TECHNIQUES

. NONE

FAA-RD-331-16-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 64 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

BOMB OF EXPLOSIVE DETECTORS AND COUNTERMEASURES TECHNIQUES FOR AIRCRAFT - EVALUATION OF EXPLOSIVE DETECTION TECHNIQUES

. NONE

FAA-RD-331-16-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 65 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRCRAFT FLIGHT RECORDERS - DEVELOPMENT OF IMPROVED FLIGHT RECORDERS

. NONE

FAA-RD-332-10-D-21
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 66 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRCRAFT FLIGHT RECORDERS - EVALUATION OF TAIL LOCATED FLIGHT RECORDERS

. NONE

FAA-RD-332-10-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 67 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRCRAFT FLIGHT RECORDERS - FLIGHT RECORDER EXPERIMENTATION

. NONE

FAA-RD-332-10-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 68 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOP COCKPIT VOICE RECORDER PROTOTYPE - COCKPIT VOICE RECORDER

. NONE

FAA-RD-337-11-D-31
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 69 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOP COCKPIT VOICE RECORDER PROTOTYPE - EVALUATION OF COCKPIT VOICE RECORDERS

. NONE

FAA-RD-337-11-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 70 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF ACCELEROMETERS

. NONE

FAA-RD-337-22-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 71 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

APPROACH, TOUCHDOWN AND TAKEOFF SURVEY - PROCURE TAKE-OFF, APPROACH, AND TOUCHDOWN DATA RECORDER

. NONE

FAA-RD-343-2-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 72 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

HELICOPTER HEIGHT VELOCITY DIAGRAM

. NONE

FAA-RD-343-10-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 73 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF COCKPIT VISIBILITY LIMITS OF NEW AIRCRAFT

. NONE

FAA-RD-347-21-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 78 1 FIELD 13B,13F

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

COMPACTED AREAS SURROUNDING AIRPORT RUNWAYS - DEVELOPMENTAL DESIGN STANDARDS FOR COMPACTED AREAS

. NONE

FAA-RD-413-2-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 80 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PENDANT CABLE SUPPORT SYSTEM FOR RUNWAY ARRESTING GEAR - DEVELOP PENDANT CABLE SUPPORT FOR RUNWAY ARRESTING GEAR

. NONE

FAA-RD-414-4-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 81 1 FIELD 7A,11G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INVESTIGATION OF CHEMICAL MEANS FOR PREVENTION OF ACCUMULATION OF SNOW AND ICE ON RUNWAY

. NONE

FAA-RD-415-2-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 82 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

REMOVAL OF SNOW AND ICE FROM AIRPORT PAVEMENTS - COST BENEFIT ANALYSIS FOR SNOW, ICE AND SLUSH REMOVAL

. NONE

FAA-RD-415-2-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 83 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

REMOVAL OF SNOW AND ICE FROM AIRPORT PAVEMENTS - DEVELOP SUITABLE TECHNIQUE FOR CONTROL OF SNOW, ICE, AND SLUSH

. NONE

FAA-RD-415-2-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 84 1 FIELD 21B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT FIRE FIGHTING EQUIPMENTS AND TECHNIQUES

. NONE

FAA-RD-415-4-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 86 1 FIELD 5E, 1C, 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

R. L. SULZER

FAA-RD-421-30-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 87 1 FIELD 1C, 9+, 9C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

L. C. VIPOND

FAA-RD-421-30-E-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 88 1 FIELD 1C, 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

L. C. VIPOND

FAA-RD-421-30-E-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 89 1 FIELD 1C, 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

L. C. VIPOND

FAA-RD-421-30-E-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 90 1 FIELD 1C, 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

L. C. VIPOND

FAA-RD-421-30-E-4
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 91 1 FIELD 1C, 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

L. C. VIPOND
FAA-RD-421-30-E-5
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 92 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR ALL-WEATHER INSTRUMENT OPERATIONS

. NONE
FAA-RD-421-30-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 93 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. L. SCHULTEN

FAA-RD-421-31-E-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 94 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. L. SCHULTEN
FAA-RD-421-031-02-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 95 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. L. SCHULTEN
FAA-RD-421-31-E-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 96 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. L. SCHULTEN

FAA-RD-421-031-04-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 97 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. L. SCHULTEN
FAA-RD-421-31-E-5
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 98 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. L. SCHULTEN
FAA-RD-421-31-E-6
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 99 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

L. C. VIPOND
FAA-RD-421-031-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 100 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT LIGHTING AND MARKING FOR GENERAL INSTRUMENT OPERATIONS

C. B. PHILLIPS

FAA-RD-421-031-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 101 1 FIELD 9C, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR VFR OPERATIONS

. NONE

FAA-RD-421-32-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 102 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR VFR OPERATIONS

. NONE

FAA-RD-421-32-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 103 1 FIELD 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR V/STOL OPERATIONS

. NONE

FAA-RD-424-1-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 104 1 FIELD 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR V/STOL OPERATIONS

. NONE

FAA-RD-424-1E-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 105 1 FIELD 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR V/STOL OPERATIONS

. NONE

FAA-RD-424-1-E-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 106 1 FIELD 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LIGHTING AND MARKING FOR V/STOL OPERATIONS

. NONE

FAA-RD-424-1-E-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 108 1 FIELD 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

OBSTRUCTION LIGHTING AND MARKING OF AVIATION HAZARDS

. NONE

FAA-RD-425-1-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 109 1 FIELD 1C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PROCUREMENT SPECIFICATIONS FOR FY-1964 - PREPARATION OF AIRPORT VISUAL AIDS PROCUREMENT SPECIFICATIONS FOR FY-1964

. NONE

FAA-RD-421-70-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 110 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CATEGORY III EVALUATION OF MINNEAPOLIS-HONEYWELL ALTIMETER WITH AUTO CHANNELL LANDING SYSTEM

. NONE

FAA-RD-114-4-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 111 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

REGAL VERTICAL GUIDANCE LANDING SYSTEM 114-9 - DEVELOPMENT OF REGAL VERTICAL GUIDANCE SYSTEM

. NONE

FAA-RD-114-9-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 112 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DESIGN VARIATIONS FOR ILS LOCALIZER ANTENNA FOR CATEGORY II AND III

. NONE

FAA-RD-114-10-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 113 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FLARESCAN VERTICAL GUIDANCE LANDING SYSTEM - DEVELOPMENT OF FLARESCAN

. NONE

FAA-RD-114-12-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 114 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CARAVELLE FLIGHT CONTROL EQUIPMENT FOR CATEGORY III - FLIGHT CONTROL EQUIPMENT FOR CARAVELLE

. NONE

FAA-RD-114-13-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 115 1 FIELD 13F, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOW APPROACH SYSTEM FOR HELICOPTERS - D EVELOP HELICOPTER LOW APPROACH SYSTEM

. NONE

FAA-RD-114-14-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 116 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CATEGORY II AND CATEGORY III LANDING INSTRUMENTATION AND DISPLAYS

. NONE

FAA-RD-114-15-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 118 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOW COST ILS SYSTEM - DEVELOPMENT OF LOW COST ILS SYSTEM

. NONE

FAA-RD-114-18-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 119 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOW COST ILS SYSTEM - EVALUATION OF LOW COST ILS SYSTEM

. NONE

FAA-RD-114-18-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 120 1 FIELD 17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

COST ANALYSIS AND WEATHER STUDY FOR LANDING SYSTEMS - CLIMATIC STUDIES FOR PROPOSED LANDING SYSTEM

. NONE

FAA-RD-114-20-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 121 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ILS ANCILLARY ITEMS IMPROVEMENT - D EVELOPMENT OF DIRECTIONAL MARKER BEACON ANTENNA ARRAY

. NONE

FAA-RD-114-21-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 122 1 FIELD 13F, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ALL-WEATHER TAKE-OFF SYSTEMS - TAKE-OFF CAPABILITY INVESTIGATION

. NONE

FAA-RD-114-22-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 124 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVEMENT OF ILS SYSTEM PERFORMANCE DURING INCLEMENT WEATHER CONDITIONS

. NONE

FAA-RD-114-25-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 125 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVEMENT OF ILS SYSTEM PERFORMANCE DURING INCLEMENT WEATHER CONDITIONS

. NONE

FAA-RD-114-25-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 126 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AN/GSN-5 (ST) LANDING SYSTEM MONITOR - E VALUATION OF AN/GSN-5 (ST) LANDING SYSTEM MONITOR

. NONE

FAA-RD-114-26-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 127 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FLUSH-MOUNTED GLIDE-SLOPE ARRAY - D EVELOPMENT OF FLUSH-MOUNTED GLIDE-SLOPE ARRAY

. NONE

FAA-RD-114-27-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 128 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

GLIDE SLOPE WAVEGUIDE ARRAY - DEVELOPMENT OF GLIDE SLOPE WAVEGUIDE ARRAY

. NONE

FAA-RD-114-28-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 129 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CAPTURE EFFECT GLIDE SLOPEIMPROVEMENT

. NONE

FAA-RD-114-29-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 130 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

GLIDE SLOPE SITE IMPROVEMENT - DEVELOP GLIDE SLOPE SITE IMPROVEMENTS

. NONE

FAA-RD-114-31-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 131 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ILS CATEGORY III MONITORING - DEVELOPMENT OF ILS CATEGORY III MONITORING EQUIPMENT

. NONE

FAA-RD-114-32-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 132 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FUTURE GUIDANCE SYSTEMS FOR LANDING - D EVELOPMENT OF SCAN TECHNIQUE FOR LANDING

. NONE

FAA-RD-114-33-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 133 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FUTURE GUIDANCE SYSTEMS FOR LANDING - R ESEARCH ON FUTURE GUIDANCE SYSTEMS FOR LANDING

. NONE
FAA-RD-114-33-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 134 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FUTURE LANDING MONITOR - DEVELOPMENT OF MONITOR SYSTEM

. NONE
FAA-RD-114-34-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 135 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MULTI-ELEMENT GLIDE SLOPE ARRAY - D EVELOPMENT OF MULTI-ELEMENT GLIDE SLOPE ARRAY

. NONE
FAA-RD-114-36-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 136 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RELIABILITY ANALYSIS FOR CATEGORY III LANDING SYSTEM

. NONE
FAA-RD-114-38-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 138 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DOMESTIC CATEGORY III AUTOMATIC LANDING SYSTEM - EVALUATION OF DOMESTIC CATEGORY III LANDING SYSTEM

. NONE
FAA-RD-114-42-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 140 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CATEGORY III LANDING SYSTEM AIRBORNE ENGINEERING

. NONE
FAA-RD-114-45-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 141 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INSTRUMENT LANDING SYSTEM STANDARDS FOR CATEGORY II AND III LANDING SYSTEMS

. NONE

FAA-RD-114-47-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 142 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CATEGORY III LANDING SYSTEM LOCALIZER - D EVELOPMENT OF CATEGORY III LANDING SYSTEM LOCALIZER

. NONE

FAA-RD-114-50-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 144 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CATEGORY III LANDING SYSTEM ILS ANCILLARY COMPONENTS - DEVELOPMENT OF CATEGORY III LANDING SYSTEM ILS ANCILLARY COMPONENTS

. NONE

FAA-RD-114-52-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 145 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PREPARATION OF SPECIFICATIONS FOR FY-1964 F+E PROGRAM - PREPARATION OF ENVIRONMENTAL SPECIFICATIONS FOR APPROACH AND LANDING FACILIT

. NONE

FAA-RD-114-70-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 146 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PREPARATION OF SPECIFICATIONS FOR FY-1965 F+E PROGRAM - PREPARATION OF ENVIRONMENTAL SPECIFICATIONS FOR APPROACH AND LANDING FACILIT

. NONE

FAA-RD-114-71-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 158 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PRESSURE ALTIMETERS - DEVELOP STANDARDS FOR ALTIMETER SYSTEM CALIBRATION AND ALTIMETER SYSTEM IMPROVEMENTS

. NONE

FAA-RD-115-22-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 159 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PRESSURE ALTIMETERS - EVALUATION OF ALTIMETER SYSTEM IMPROVEMENTS, PHASE I EVALUATION OF AIRESEARCH ALTIMETER

. NONE

FAA-RD-115-22-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 160 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PRESSURE ALTIMETER FLIGHT TECHNICAL ERROR - MEASUREMENT OF THE FLIGHT TECHNICAL ERROR

. NONE

FAA-RD-115-23-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 200 1 FIELD 17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ORGANIZED SYSTEM OF AIR ROUTES FOR NORTH ATLANTIC AREA - STUDY OF ORGANIZED SYSTEM OF TRANS-ATLANTIC AIR ROUTES

. NONE

FAA-RD-116-33-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 219 1 FIELD 13F,12A, 5C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT CONGESTION STUDY - FAST-TIME SIMULATION OF AIR TRAFFIC AT SELECTED TERMINALS

. NONE

FAA-RD-101-148-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 220 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOS ANGELES JETPORT - LOS ANGELES JETPORT SIMULATION

. NONE

FAA-RD-101-171-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 222 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EXPERIMENTAL TESTING OF AN ILS ON RUNWAY 13L AT IDLEWILD AIRPORT

. NONE

FAA-RD-101-174-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 224 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EQUIPMENT CONFIGURATION STANDARDS FOR TOWER CABS

. NONE

FAA-RD-101-910-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 225 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF TOWER CAB TURRET CONSOLE

. NONE

FAA-RD-101-910-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 227 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

GROUND REDUNDANT CONTROL LIGHT SYSTEM

. NONE
FAA-RD-101-911-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 228 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF GROUND CLEARANCE REDUNDANT CONTROL LIGHT SYSTEM . NONE
FAA-RD-101-911-1-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 230 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SYSTEM EXPERIMENTATION AND DESIGN SUPPORT

. NONE
FAA-RD-103-14-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 231 1 FIELD 9+,12A, 9D

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SYSTEM EXPERIMENTATION AND DESIGN SUPPORT - TERMINAL - EXPERIMENTATION IN SUPPORT OF TERMINAL CONCEPTS AND SYSTEM DESIGN
. NONE

FAA-RD-104-125-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

02. Agriculture

YUT 6 3 FIELD 13G,11G

UTAH ST UNIV OF AGRIC, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, UTAH

LINING OF IRRIGATION CANALS AND RESERVOIRS

C. W. LAURITZEN

UTAH-211
/66- /

STATE-UTAH

04. Atmospheric Sciences

YOR 118 3

OREGON STATE UNIV, AGRICULTURAL EXPT STA, ADMINISTRATION, OREGON

HAIL DISTRIBUTION, PROPERTIES, AND DAMAGE IN THE SOUTHERN OREGON AREA

F. W. DECKER

OREG-444
/66- /

STATE-OREGON

YOR 235 3 FIELD 4A,12A, 8E

OREGON STATE UNIV, AGRICULTURAL EXPT STA, FOREST RESEARCH LAB, OREGON

NATURAL CALENDAR OF THE ATMOSPHERE IN OREGON

. NONE

OREG-615
/66- /

STATE-OREGON

YUT 73 3 FIELD 4B

UTAH ST UNIV OF AGRIC, AGRICULTURAL EXPT STA, AGRONOMY, UTAH

INVESTIGATION OF PHYSICAL PROCESSES AT THE AIR-GROUND INTER-BOUNDARY AND OF TURBULENT TRANSFER IN THE LOWER AIR LAYERS

G. L. ASHCROFT

UTAH-578
/66- /

STATE-UTAH

YWI 203 1

UNIV OF WISCONSIN, AGRICULTURAL EXPT STA, SOILS, WISCONSIN

ATMOSPHERIC TRANSPORT OVER NATURAL SURFACES

C. B. TANNER

WISC-1224
/66- /

STATE-WISCONSIN

YWY 1 3

UNIVERSITY OF WYOMING, AGRICULTURAL EXPT STA, AGR. BIOCHEM. IS, WYOMING

RECORDING AND PUBLICATION OF WEATHER OBSERVATIONS - TO RECORD AND PUBLISH WEATHER OBSERVATIONS COLLECTED AT LARAMIE, WYOMING.

H. F. EPPSON

WYO-389
/66- /

STATE-WYOMING

YWY 11 3 FIELD 20M, 8D, 4A,10B

UNIVERSITY OF WYOMING, AGRICULTURAL EXPT STA, PLANT SCIENCES, WYOMING

SOLAR RADIATION ADAPTATION FOR WYOMING

C. F. BECKER

WYO-WS-674
/66- /

STATE-WYOMING

ZBA 1666 FIELD 4A, 5A

USDC, NATL BUR STAN, BOULDER, COLORADO

D REGION STUDIES

D. D. CROMBIE

NBS-5100106
/65- /

COMMERCE-NATIONAL BUREAU OF STANDARDS

ZBA 1785 FIELD 4A, 8+, 9+,20I

USDC, NATL BUR STAN, BOULDER, COLORADO

IONOSPHERIC TOPSIDE SOUNDER PROJECT IONOSPHERIC STRUCTURE - TOPSIDE

E. E. FERGUSON

NBS-5400142
/65- /

COMMERCE-NATIONAL BUREAU OF STANDARDS

ZFE 81 1 FIELD 8H

USA, CORPS ENGRS, HONOLULU, HAWAII

STORM STUDIES - HAWAIIAN ISLANDS

E. O. ARMOCIDA, R. V. OEHLER
R. R. PULFREY

/65- /

ARMY-CORPS OF ENGINEERS

ZKD 1 1 FIELD 4B, 9+,12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA CONTROL AND SUPERVISION - EQUIPMENT DEVELOPMENT

. NONE

FAA-RD-203-2-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 3 1 FIELD 4B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PILOT-TO-FORECASTER SERVICE TEST

. NONE

FAA-RD-203-4-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 4 1 FIELD 8+, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AUTOMATIC WEATHER BROADCASTS - EQUIPMENT DEVELOPMENT

. NONE

FAA-RD-203-5-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 5 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC WEATHER DATA DISPLAY SYSTEM - E QUIPMENT DEVELOPMENT FOR BASIC ATC-WEATHER DISPLAY SYSTEM

. NONE

FAA-RD-205-1-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 6 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC WEATHER DATA DISPLAY SYSTEM - E QUIPMENT EXPERIMENTATION FOR BASIC ATC/WEATHER SYSTEM

. NONE

FAA-RD-205-1-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 7 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC WEATHER DATA DISPLAY SYSTEM - TEST AND EVALUATION OF BASIC ATC/WEATHER SYSTEM

. NONE

FAA-RD-205-1-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 8 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT WEATHER DATA DISPLAY SYSTEM - E QUIPMENT DEVELOPMENT FOR BASIC AIRPORT DISPLAY SYSTEM

. NONE

FAA-RD-205-2-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 9 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT WEATHER DATA DISPLAY SYSTEM - E QUIPMENT EXPERIMENTATION FOR BASIC AIRPORT DISPLAY SYSTEM

. NONE

FAA-RD-205-2-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 10 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRPORT WEATHER DATA DISPLAY SYSTEM - T EST AND EVALUATION OF BASIC AIRPORT DISPLAY SYSTEM

. NONE

FAA-RD-205-2-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 11 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

WEATHER GRAPHIC DISPLAY EQUIPMENT - W EATHER GRAPHIC DISPLAY DEVELOPMENT

. NONE

FAA-RD-205-3-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 12 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOCAL AND REMOTE WEATHER RADAR DISPLAY DEVICES AND TECHNIQUES - WEATHER RADAR DISPLAY

. NONE

FAA-RD-205-5-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 13 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOCAL AND REMOTE WEATHER RADAR DISPLAY DEVICES AND TECHNIQUES - WEATHER RADAR DISPLAY, EXPERIMENTATION OF TECHNIQUES AND DEVICES

. NONE

FAA-RD-205-5-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 14 1 FIELD 5E, 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LOCAL AND REMOTE WEATHER RADAR DISPLAY DEVICES AND TECHNIQUES - WEATHER RADAR DISPLAY EVALUATION.

. NONE

FAA-RD-205-5-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

06. Biological and Medical Sciences

YWA 117 3 FIELD 7C, 7A, 7D

WASHINGTON STATE UNIV, AGRICULTURAL EXPT STA, AGR. CHEM. RY, WASHINGTON

THE INTERACTION OF ATP ANALOGS WITH MYOSIN

R. G. YOUNT

WASH-1619
/66- /

STATE-WASHINGTON

07. Chemistry

ZAK 93 2 FIELD 7C, 7D,20M,20J

USAF, OAR, ARL, WRIGHT-PATT-CHEM RES, OHIO

RESEARCH ON PERARYLATED SILANES

L. SPIALTER

AF-702301
/65- /

AIR FORCE-OFFICE OF AEROSPACE RESEARCH

08. Earth Sciences and Oceanography

YIL 248 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

PENNSYLVANIAN STRATIGRAPHY

J. A. SIMON, K. E. CLEGG, M. E. HOPKINS W. H. SMITH
/65- /

STATE-ILLINOIS

YIL 254 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

PALEOBOTANICAL STUDIES

R. A. PEPPERS
/65- /

STATE-ILLINOIS

YIL 255 1 FIELD 8D, 8G,11B

STATE, GEOL SURV URBNA, ILLINOIS

PETROLOGY OF ILLINOIS CLAYS AND CLAY MINERAL TECHNOLOGY

W. A. WHITE

/65- /

STATE-ILLINOIS

YIL 257 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

BASAL NEW ALBANY STRUCTURE MAP

L. L. WHITING, D. L. STEVENSON

/65- /

STATE-ILLINOIS

YIL 258 1 FIELD 13B, 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

SAND AND GRAVEL RESOURCES OF ILLINOIS

R. E. HUNTER, J. E. LAMAR

/65- /

STATE-ILLINOIS

YIL 259 1 FIELD 13B, 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

SAND AND GRAVEL RESOURCES OF ILLINOIS WATERWAY

J. E. LAMAR

/65- /

STATE-ILLINOIS

YIL 261 1 FIELD 8D, 8G, 7B

STATE, GEOL SURV URBNA, ILLINOIS

WALL ROCK ALTERATION IN THE NORTHWESTERN ILLINOIS ZINC-LEAD DISTRICT

J. C. BRADBURY

/65- /

STATE-ILLINOIS

YIL 262 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

MINERALIZATION STUDIES OF THE SANDWICH FAULT

J. C. BRADBURY

/65- /

STATE-ILLINOIS

YIL 263 1 FIELD 8G

STATE, GEOL SURV URBNA, ILLINOIS

PHYSICAL PROPERTIES OF ILLINOIS LIMESTONES AND DOLOMITES

R. D. HARVEY, J. E. LAMAR

/65- /

STATE-ILLINOIS

YIL 264 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

SOUTHWESTERN AND WESTERN ILLINOIS LIMESTONE RESOURCES

J. W. BAXTER, R. D. HARVEY

/65- /

STATE-ILLINOIS

YIL 265 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

REMAPPING THE GEOLOGY OF HARDIN AND ADJACENT PARTS OF POPE, SALINE, AND GALLATIN COUNTIES

J. W. BAXTER

/65- /

STATE-ILLINOIS

YIL 266 1 FIELD 8D, 8G,11B

STATE, GEOL SURV URBNA, ILLINOIS

TERRAZZO CHIP RESOURCES OF EXTREME SOUTHERN ILLINOIS

R. D. HARVEY

/65- /

STATE-ILLINOIS

YIL 267 1 FIELD 8H, 8G

STATE, GEOL SURV URBNA, ILLINOIS

REVISION OF GEOLOGIC MAP OF ILLINOIS

H. B. WILLMAN

/65- /

STATE-ILLINOIS

YIL 268 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

LACON QUADRANGLE

H. B. WILLMAN

/65- /

STATE-ILLINOIS

YIL 269 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

CLAY MINERAL COMPOSITION OF CAMBRIAN SHALES

H. D. GLASS

/65- /

STATE-ILLINOIS

YIL 270 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

CAMBRIAN AND ORDOVICIAN STRATIGRAPHY

T. C. BUSCHBACH, E. ATHERTON

/65- /

STATE-ILLINOIS

YIL 271 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

SILURIAN STRATIGRAPHY

H. B. WILLMAN

/65- /

STATE-ILLINOIS

YIL 272 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

DEVONIAN STRATIGRAPHY

D. H. SWANN, E. ATHERTON, C. COLLINSON
W. F. MEENTS

/65- /

STATE-ILLINOIS

YIL 273 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

MISSISSIPPIAN STRATIGRAPHY

D. H. SWANN, C. COLLINSON

/65- /

STATE-ILLINOIS

YIL 274 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

PLEISTOCENE STRATIGRAPHY

J. C. FRYE, H. D. GLASS, H. B. WILLMAN

/65- /

STATE-ILLINOIS

YIL 275 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

PENNSYLVANIAN FUSULINIDS

M. L. THOMPSON

/65- /

STATE-ILLINOIS

YIL 276 1 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

CONODONT STUDIES

C. COLLINSON

/65- /

STATE-ILLINOIS

YIN 186 1 FIELD 8D, 8H

IND GEOLOGICAL SURVE, INDIANA

NATURAL BRINES OF INDIANA

S. J. KELLER, S. P. KELLER
R. K. LEININGER

/66- /

STATE-INDIANA

YIN 226 FIELD 8F, 8G, 8H

IND GEOLOGICAL SURVE, INDIANA

A GEOPHYSICAL STUDY OF GRANT COUNTY FOR WATER RESOURCES

J. F. WHALEY
/66- /

STATE-INDIANA

YIN 227 FIELD 13B, 8H

PURDUE UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, INDIANA

URBAN HYDROLOGY FOR SELECTED SITES IN INDIANA

J. W. DELLEUR, E. VICIAN
/66- /

STATE-INDIANA

YKA 150 1 FIELD 8H

KANSAS ST UNIV AGR SCI, AGRICULTURAL EXPT STA, GEOLOGY, KANSAS

RECHARGE OF GROUND WATER IN RIVER VALLEYS OF EASTERN AND CENTRAL KANSAS, AND THE HIGH PLAINS

. NONE

KANS-0698
/66- /

STATE-KANSAS

YKA 151 1 FIELD 8H

KANSAS ST UNIV AGR SCI, AGRICULTURAL EXPT STA, GEOLOGY, KANSAS

EFFECTS OF TUTTLE CREEK RESERVOIR ON GROUND WATER LEVELS BELOW THE DAM

. NONE

KANS-0699
/66- /

STATE-KANSAS

YMD 86 FIELD 8H

STATE, GEOL SURV BALTO, MARYLAND

COLLECTION OF BASIC RECORDS OF GROUND-WATER LEVELS AND PUMPAGE

C. A. RICHARDSON, C. P. RICHARDSON
J. W. WARK, K. N. WEAVER

/65- /

STATE-MARYLAND

YMD 87 FIELD 13B, 7D, 8H, 7B

STATE, GEOL SURV BALTO, MARYLAND

APPRAISAL OF WATER RESOURCES OF TALBOT AND DORCHESTER COUNTIES, MARYLAND

F. K. MACK, R. A. GARDNER, F. P. MACK
J. W. WARK, K. N. WEAVER, W. E. WEBB

/65- /

STATE-MARYLAND

YMD 88 FIELD 8N, 8F, 8G, 8H

STATE, GEOL SURV BALTO, MARYLAND

AQUIFER STUDIES IN MARYLAND - PHASE I, CRYSTALLINE ROCKS

E. G. OTTON, H. H. HANSEN, E. P. OTTON
J. W. WARK, K. N. WEAVER

/65- /

STATE-MARYLAND

YMD 89 FIELD 7D, 8D, 8H

STATE, GEOL SURV BALTO, MARYLAND

CHEMICAL QUALITY RECONNAISSANCE OF MARYLAND STREAMS

J. D. THOMAS, J. P. THOMAS, J. W. WARK
K. N. WEAVER

/65- /

STATE-MARYLAND

YMO 1 FIELD 8H

MISSOURI STATE GEOL., MISSOURI

GROUNDWATER SUPPLY

R. KNIGHT, K. ANDERSON, D. L. FULLER

/66- /

STATE-MISSOURI

YMO 2 FIELD 8H

MISSOURI STATE GEOL., MISSOURI

OBSERVATION OF GROUNDWATERLEVELS

D. L. FULLER, R. KNIGHT, A. KOCH
J. A. MARTIN, J. H. WILLIAMS

/66- /

STATE-MISSOURI

YMO 5 FIELD 8D, 8H

MISSOURI STATE GEOL., MISSOURI

HYDROLOGIC INVESTIGATIONS PRIOR TO MINE DEVELOPMENT

D. L. FULLER

/66- /

STATE-MISSOURI

YMO 8 FIELD 8H, 8G

MISSOURI STATE GEOL., MISSOURI

STRATIGRAPHIC STUDIES

K. ANDERSON, H. GROVES, C. ROBERTSON
J. WELLS

/66- /

STATE-MISSOURI

YMO 9 FIELD 8H,12A, 8E

MISSOURI STATE GEOL., MISSOURI

DATA RECOVERY

K. ANDERSON

/66- /

STATE-MISSOURI

YMO 12 FIELD 8H

MISSOURI STATE GEOL., MISSOURI

INVESTIGATIONS OF SPRINGS

J. D. VINEYARD

/66- /

STATE-MISSOURI

YND 13 FIELD 8F, 8H, 8G

MISSOURI STATE GEOL., MISSOURI

CAVE SYSTEMS

J. O. VINEYARD

/66- /

STATE-MISSOURI

YND 40 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF TRAILL COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 41 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF BARNES COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 42 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF DIVIDE COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 43 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF EDDY AND FOSTER COUNTIES

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 44 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF WELLS COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 45 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF GRAND FORKS COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 46 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF WILLIAMS COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 47 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF WARD COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 48 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF CASS COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 49 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF RICHLAND COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 50 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF BURKE COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 51 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF RENVILLE COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 52 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF BURLEIGH COUNTY

W. M. LAIRD, W. O. LAIRD

/66- /

STATE-NORTH DAKOTA

YND 53 FIELD 8H, 8G

STATE, GEOL SURV GRAND, NORTH DAKOTA

GEOLOGY AND GROUND WATER RESOURCES OF STUTSMAN COUNTY

W. M. LAIRD, W. O. LAIRD
/66- /

STATE-NORTH DAKOTA

YNM 78 2 FIELD 8H

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

BANK STORAGE OWING TO FLOOD STAGES IN SURFACE STREAMS

M. S. HANTUSH
/66- /

STATE-NEW MEXICO

YNM 81 2 FIELD 8H, 8E,12A

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

EXPERIMENTAL VERIFICATION OF THEORETICAL SOLUTIONS FOR SEVERAL GROUND-WATER FLOW PROBLEMS

M. S. HANTUSH

/66- /

STATE-NEW MEXICO

YNM 85 2 FIELD 8N, 8H

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

APPLICATION OF THE INDUCED POLARIZATION METHOD TO THE EVALUATION OF UNDERGROUND WATER SUPPLIES

C. R. HOLMES, G. W. GROSS

/66- /

STATE-NEW MEXICO

YNM 86 2 FIELD 8D, 8H, 7B

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

TRITIUM CONTENT OF ATMOSPHERIC AND SURFACE WATERS

C. R. HOLMES

/66- /

STATE-NEW MEXICO

YNM 87 2 FIELD 8H, 7B

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

GROUND WATER MOTION IN THE ROSWELL ARTESIAN BASIN BY TRITIUM ANALYSIS

C. R. HOLMES

/66- /

STATE-NEW MEXICO

YNM 94 1 FIELD 8H

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

GROWTH AND DECAY OF FRESH-WATER LENSES IN OCEANIC ISLANDS AND IN THICK COASTAL UNC

M. S. HANTUSH
/65- /

STATE-NEW MEXICO

YNM 107 FIELD 8H

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

SALVAGE OF EVAPOTRANSPIRATION LOSSES BY PUMPING WELLS

M. S. HANTUSH
/66- /

STATE-NEW MEXICO

YNM 108 FIELD 8F, 8G, 8H, 8+

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, PHYSICS, NEW MEXICO

USE OF RADAR FOR HYDROLOGICAL STUDIES

M. BROOK

/66- /

STATE-NEW MEXICO

YNV 17 1 FIELD 8H,12A, 8E

UNIVERSITY OF NEVADA, GRADUATE SCHOOL, DESERT RESEARCH INST, NEVADA

THE USE OF AN ANALOG SIMULATOR TO STUDY SURFACE FLOW AND STORAGE ON THE HUMBOLDT RIVER

P. A. DOMENICO, J. J. MERKEL

X
/66- /

STATE-NEVADA

YNV 20 1 FIELD 8H

UNIVERSITY OF NEVADA, GRADUATE SCHOOL, DESERT RESEARCH INST, NEVADA

HYDROGEOLOGY OF THE LOWER HUMBOLDT BASIN

G. B. MAXEY, P. A. DOMENICO
R. N. FARVOLDEN

X
/66- /

STATE-NEVADA

YOR 81 3 FIELD 13B, 8D, 7B

OREGON STATE UNIV, AGRICULTURAL EXPT STA, SOILS, OREGON

RELATIONSHIP OF SOIL PROPERTIES TO CHEMICAL REACTIONS AND OTHER PHENOMENA INVOLVING SULFUR

M. E. HARWARD

OREG-310
/66- /

STATE-OREGON

YOR 180 3 FIELD 13B, 7D, 8D, 8G

OREGON STATE UNIV, AGRICULTURAL EXPT STA, SOILS, OREGON

LOCATION OF CHARGE AND CHEMICAL PROPERTIES OF CLAYS

M. E. HARWARD

OREG-551
/66- /

STATE-OREGON

YPA 185 FIELD 13G, 8H

BOURQUARD E H + ASSOC, PENNSYLVANIA

NESHAMINY BASIN STUDY

C. H. MCCONNELL
1/65- 1/65

STATE-PENNSYLVANIA

YSD 59 FIELD 8D, 8H, 8G

STATE, GEOL SURV VERML, SOUTH DAKOTA

GEOLOGY AND HYDROLOGY OF BON HOMME COUNTY, SOUTH DAKOTA

C. H. CHRISTENSEN, C. +. CHRISTENSEN
J. C. STEPHENS
/66- /

STATE-SOUTH DAKOTA

YSD 60 FIELD 8D, 8H, 8G

STATE, GEOL SURV VERML, SOUTH DAKOTA

GEOLOGY AND GROUND WATER SUPPLIES OF CAMPBELL COUNTY, SOUTH DAKOTA

L. S. HEDGES, L. +. HEDGES, N. C. KOCH

/66- /

STATE-SOUTH DAKOTA

YTX 272 FIELD 13G,13B, 8H

TEXAS A + M UNIVERSITY, SCHOOL OF AGRICULTURE, SOIL + CROP SCIENCE, TEXAS

RELATIONSHIP OF EVAPORATION RATES OF MINERALIZED WATERS TO FRESH WATER

J. R. RUNKLES

TWC-4423-954
7/64- 6/65

STATE-TEXAS

YUT 136 FIELD 8H, 8G, 7B

STATE, GEOL MINERALOG, UTAH

CHEMICAL QUALITY OF BRINES ASSOCIATED WITH DEEP SEDIMENTS BENEATH GREAT SALT LAKE

R. E. COHENOUR, W. P. HEWITT
R. B. KAYSER, M. L. SUTTON

/66- /

STATE-UTAH

YUT 137 FIELD 8D, 8F, 8K, 8G

STATE, GEOL MINERALOG, UTAH

SALT DISTRIBUTION ALONG LAKE BOTTOM AND WITHIN DEEP SEDIMENTS BENEATH GREAT SALT L

R. E. COHENOUR, W. P. HEWITT
R. B. KAYSER

/66- /

STATE-UTAH

YUT 138 FIELD 8G, 8H

STATE, GEOL MINERALOG, UTAH

HYDROLOGY OF THE SUB-LAKE SEDIMENTS BENEATH GREAT SALT LAKE

R. E. COHENOUR, W. P. HEWITT
R. B. KAYSER

/66- /

STATE-UTAH

YVA 193 FIELD 8H

STATE, DIV MIN RESOUR, VIRGINIA

OBSERVATION WELL PROGRAM

J. L. CALVER
/66- /

STATE-VIRGINIA

YVA 194 FIELD 8N, 8F, 8G, 8H

STATE, DIV MIN RESOUR, VIRGINIA

STATE OF VIRGINIA GEOPHYSICAL STUDIES

J. L. CALVER
/66- /

STATE-VIRGINIA

YVA 195 FIELD 8D, 8H

STATE, DIV MIN RESOUR, VIRGINIA

STATE OF VIRGINIA GEOCHEMICAL STUDIES

J. L. CALVER

/66- /

STATE-VIRGINIA

YVA 196 FIELD 8F, 8H

STATE, DIV MIN RESOUR, VIRGINIA

STATE OF VIRGINIA HYDROGEOLOGIC STUDIES

J. L. CALVER
/66- /

STATE-VIRGINIA

YVA 197 FIELD 8H, 8G

STATE, DIV MIN RESOUR, VIRGINIA

GEOLOGY AND GROUND-WATER INVESTIGATIONS IN VIRGINIA

J. L. CALVER

/66- /

STATE-VIRGINIA

ZAK 113 2 FIELD 8E,12A

USAF, W-P AFB, OHIO

GRAVITY FORMULA COEFFICIENTS

B. SZABO

AF-860702
/65- /

AIR FORCE-OFFICE OF AEROSPACE RESEARCH

ZFE 72 1 FIELD 13G, 8F, 8C

USA, CORPS ENGRS, DIST OF COLUMBIA

CORRELATION OF BEACH PROPERTIES AND INCIDENT WAVES

T. SAVILLE
/65- /

ARMY-CORPS OF ENGINEERS

ZFE 77 1 FIELD 13G, 8C

USA, CORPS ENGRS, DIST OF COLUMBIA

STUDY OF EFFECT OF GROIN FIELDS ON LITTORAL DRIFT

T. SAVILLE

/65- /

ARMY-CORPS OF ENGINEERS

ZFE 79 1 FIELD 8C,12A, 8E

USA, CORPS ENGRS, DIST OF COLUMBIA

WAVE RECORDING AND ANALYSIS

T. SAVILLE
/65- /

ARMY-CORPS OF ENGINEERS

ZFE 80 1 FIELD 8H

USA, CORPS ENGRS, HONOLULU, HAWAII

HYDROLOGIC RELATIONS IN HAWAII

E. O. ARNUCIDA, R. V. OEHLER
R. R. PULFREY

/65- /

ARMY-CORPS OF ENGINEERS

11. Materials

YOR 323 1 FIELD 11L

OREGON STATE UNIV, AGRICULTURAL EXPT STA, FOREST SCIENCE, OREGON

DURABILITY OF PARTICLE BOARD IN EXTERIOR EXPOSURE

W. F. LEHMANN

OREG-0697
/66- /

STATE-OREGON

YPA 178 1 FIELD 11L

PENNSYLVANIA ST UNIV, AGRICULTURAL EXPT STA, FORESTRY, PENNSYLVANIA

PHYSICAL AND MECHANICAL PROPERTIES OF WOOD PARTICLE BOARDS

W. K. MURPHEY

PA-1243-D
/66- /

STATE-PENNSYLVANIA

13. Mechanical, Industrial, Civil, and Marine Engineering

YNM 79 2 FIELD 13G, 8H

NEW MEX INST MIN + TEC, GRADUATE SCHOOL, GROUNDWATER HYDROLOGY, NEW MEXICO

HYDRAULICS OF WELLS

M. S. HANTUSH

/66- /

STATE-NEW MEXICO

YNY 327 3 FIELD 13B,13F,11B

CORNELL UNIVERSITY, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, NEW YORK

A STUDY OF PROCEDURES FOR EVALUATING THE SUITABILITY OF GRAVEL MIXTURES FOR HIGHWAY USE

J. W. SPENCER

NYC-65
/66- /

STATE-NEW YORK

YNY 347 3 FIELD 13G, 8H,12A, 8E

CORNELL UNIVERSITY, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, NEW YORK

A STUDY OF THE EFFECTS OF CHANNEL HYDRAULICS ON THE SHAPE OF THE RUNOFF HYDROGRAPH

R. D. BLACK

NYC-79
/66- /

STATE-NEW YORK

YNY 591 FIELD 13B

STATE, HEALTH DEPT.,, ALBANY, NEW YORK

LONG ISLAND RECHARGE STUDY

D. STEVENS
1/65-12/65

STATE-NEW YORK

YNY 592 FIELD 13B

STATE, HEALTH DEPT.,, ALBANY, NEW YORK

LONG ISLAND GROUND WATER POLLUTION STUDIES

D. B. STEVENS

7/65- 6/66

STATE-NEW YORK

YOH 33 3 FIELD 13B

OHIO STATE UNIVERSITY, AGRICULTURAL EXPT STA, AGRONOMY, OHIO

SEPTIC TANK EFFLUENT DISPOSAL IN SOIL

G. S. TAYLOR

OHIO-116
/66- /

STATE-OHIO

YOH 168 FIELD 13G,13B, 8F, 8H

STATE, NATURAL RES DPT, COLUMBUS, OHIO

EVALUATION OF THE EFFECT OF LOW FLOW DURATION ON THE RATE OF INFILTRATION RECHARGE FROM A SURFACE STREAM TO AN UNCONSOLIDATED AQUIFE

P. KASER, C. R. COLLIER, J. J. MOLLOY
S. E. NORRIS
/66- /

STATE-OHIO

YOR 88 3 FIELD 13B, 8E

OREGON STATE UNIV, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, OREGON

ENGINEERING ASPECTS OF SOIL HEAT EXTRACTION

M. G. CROPSEY

OREG-330
/66- /

STATE-OREGON

YOR 324

OREGON STATE UNIV, AGRICULTURAL EXPT STA, FOREST SCIENCE, OREGON

DETERMINATION OF STRENGTH OF RESIDENTIAL FLOORS

G. H. ATHERTON

OREG-0698
/65- /

STATE-OREGON

YOR 325

OREGON STATE UNIV, AGRICULTURAL EXPT STA, FOREST SCIENCE, OREGON

INVESTIGATION OF ACCEPTABILITY OF RESIDENTIAL FLOORS FROM STANPOINT OF DEFLECTION AND VIBRATION CHARACTERISTICS

G. H. ATHERTON

OREG-0699
/65- /

STATE-OREGON

YPA 184 FIELD 13G

PENNSYLVANIA ST UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, PENNSYLVANIA

MODEL STUDIES AND HYDRAULIC RESEARCH

C. H. MCCONNELL, S. SHULITS

4/64- 1/65

STATE-PENNSYLVANIA

YPA 187 FIELD 13B, 8D, 8F, 8H

PA DEPT OF HEALTH HA, PENNSYLVANIA

SUBSURFACE WATER POLLUTION FROM SANITARY LANDFILLS IN CARBONATE ROCK TERRAIN

G. H. EMRICH, R. PARIZEK, R. SHIPP

/66- /

STATE-PENNSYLVANIA

YTX 271 FIELD 13B, 8H,12A, 8E

UNIV OF TEXAS, AUSTIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, TEXAS

A STUDY OF SOME EFFECTS OF URBANIZATION ON STORM RUNOFF FROM A SMALL WATERSHED

F. D. MASCH, W. H. ESPEY

TWC-4413-1048
9/64- 8/65

STATE-TEXAS

YUT 134 FIELD 13G, 8H,11G,11F

STATE, GEOL MINERALOG, UTAH

SHORE-LINE ENGINEERING STUDIES ON GREAT SALT LAKE

R. E. COHENOUR, W. P. HEWITT
M. L. SUTTON

/66- /

STATE-UTAH

YUT 135 FIELD 13B, 8H, 8G

STATE, GEOL MINERALOG, UTAH

ENGINEERING CHARACTERISTICS OF THE BOTTOM SEDIMENTS OF GREAT SALT LAKE

R. E. COHENOUR, W. P. HEWITT
R. B. KAYSER, A. D. PENNICHOLE
M. L. SUTTON

YWV 1 FIELD 7D, 8H, 7B

WEST VIRGINIA UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WEST VIRGINIA

STREAM ANALYSIS FOR MINE ACID WASTES

C. R. JENKINS, H. C. CARROLL

1/65- 1/66

STATE-WEST VIRGINIA

ZFE 24 1 FIELD 13G

USA, CORPS ENGRS, VICKSBURG, MISSISSIPPI

LABORATORY RESEARCH ON DIKE DESIGN

E. B. LIPSCOMB, J. J. FRANCO

7/64- 7/65

ARMY-CORPS OF ENGINEERS

ZFE 25 1 FIELD 13G

USA, CORPS ENGRS, VICKSBURG, MISSISSIPPI

DEVELOPMENT OF INSTRUMENT FOR LOCATION OF UNDERWATER REVETMENT

E. B. LIPSCOMB, W. KEARSLEY
7/64- 7/65

ARMY-CORPS OF ENGINEERS

ZFE 25 2 FIELD 13G,13B, 9+

USA, CORPS ENGRS, VICKSBURG, MISSISSIPPI

DEVELOPMENT OF INSTRUMENT FOR LOCATION OF UNDERWATER REVETMENT

E. B. LIPSCOMB, W. KEARSLEY
7/65- 7/66

ARMY-CORPS OF ENGINEERS

ZFE 71 1 FIELD 13G, 8C,20K

USA, CORPS ENGRS, DIST OF COLUMBIA

WAVE ACTION ON STRUCTURES

T. SAVILLE
/65- /

ARMY-CORPS OF ENGINEERS

ZFE 73 1 FIELD 8F, 8C,12A

USA, CORPS ENGRS, DIST OF COLUMBIA

DEVELOPMENT OF CRITERIA FOR ARTIFICIAL BEACHES

J. V. HALL, N. E. TANEY, G. M. WATTS
/65- /

ARMY-CORPS OF ENGINEERS

ZKD 77 1 FIELD 13B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SOIL STABILIZATION METHODS - DEVELOPMENT OF SOIL STABILIZATION DESIGN METHODS

. NONE

FAA-RD-413-1-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 79 1 FIELD 13F

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PAVEMENT DESIGN TEST SECTIONS

. NONE

FAA-RD-413-4-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

14. Methods and Equipment

ZBA 825 FIELD 7D,20M

USDC, NATL BUR STAN, DIST OF COLUMBIA

CONSTRUCTION OF A CALORIMETER FOR MEASURING SPECIFIC HEATS DOWN TO 0.3 DEGREES KELVIN

J. H. COLWELL
NBS-2210135-A
/65- /

COMMERCE-NATIONAL BUREAU OF STANDARDS

ZBA 1204 FIELD 14B,20D, 7B

USDC, NATL BUR STAN, BOULDER, COLORADO

IN-FLIGHT HYDROGEN DENSITY MEASUREMENTS

C. E. MILLER

NBS-3150464
/65- /

COMMERCE-NATIONAL BUREAU OF STANDARDS

ZBA 1205 FIELD 14B,20D

USDC, NATL BUR STAN, BOULDER, COLORADO

NUCLEAR MAGNETIC RESONANCE FOR MEASUREMENT OF LIQUID HYDROGEN DENSITY

C. E. MILLER

NBS-3150463
/65- /

COMMERCE-NATIONAL BUREAU OF STANDARDS

ZBA 1206 FIELD 20M,20D, 7B

USDC, NATL BUR STAN, BOULDER, COLORADO

SLUSH HYDROGEN INSTRUMENTATION TO DETERMINE FRACTION SOLIDS

W. J. ALSPACH

NBS-3150461
/65- /

COMMERCE-NATIONAL BUREAU OF STANDARDS

17. Navigation, Communications, Detection, and Countermeasures

ZKD 15 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES IN SUPPORT OF ATC SYSTEM DESIGN AND OPERATION - OPERATIONS ANALYSIS AND RESEARCH TO SUPPORT ATC

. NONE

FAA-RD-206-1-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 16 1 FIELD 4B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES IN SUPPORT OF ATC SYSTEM DESIGN AND OPERATION - ENGINEERING STUDIES TO SUPPORT ATC

. NONE

FAA-RD-206-1-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 20 1 FIELD 1C, 1B,17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDIES IN SUPPORT OF NAVIGATION DESIGN AND OPERATIONS - ENVIRONMENTAL EFFECTS OF AIR NAVIGATION

. NONE

FAA-RD-206-4-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 21 1 FIELD 4B, 9+,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SYSTEM EXPERIMENTATION AND EVALUATION

. NONE

FAA-RD-206-9-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 22 1 FIELD 4B, 9+,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SYSTEM EXPERIMENTATION AND EVALUATION

. NONE

FAA-RD-206-9-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 23 1 FIELD 4B, 9+,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SYSTEM EXPERIMENTATION AND EVALUATION

. NONE

FAA-RD-206-9X-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 24 1 FIELD 12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA PROCESSING AND TECHNICAL SUPPORT - T RAFFIC

. NONE

FAA-RD-150-1-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 26 1 FIELD 9+, 5A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NAS CHART OVERLAYS FOR THE SYSTEM DESIGN TEAM

. NONE

FAA-RD-150-3-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 27 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIR TRANSPORT ASSOCIATION DELAY STUDY

. NONE

FAA-RD-150-4-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 28 1 FIELD 12A, 5C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA PROCESSING + TECHNICAL SUPPORT - E CONOMIC

. NONE

FAA-RD-151-1-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 143 1 FIELD 13F, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CATEGORY III LANDING SYSTEM GLIDE SLOPE - DEVELOPMENT OF CATEGORY III LANDING SYSTEM GLIDE SLOPE

. NONE

FAA-RD-114-51-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 147 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

HYBRID NAVIGATION - FLIGHT AND LABORATORY TESTING OF MINIMUM AIR NAVIGATION SYSTEM (MANS)

. NONE

FAA-RD-115-5-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 148 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AREA COVERAGE NAVIGATION DISPLAYS - D EVELOP VORTAC AREA COVERAGE NAVIGATION DISPLAYS

. NONE

FAA-RD-115-7-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 149 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AREA COVERAGE NAVIGATION DISPLAYS - AREA COVERAGE DISPLAYS AND COURSE LINE COMPUTERS EXPERIMENTATION

. NONE

FAA-RD-115-7-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 151 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AREA COVERAGE NAVIGATION DISPLAYS - R ESEARCH ON INTEGRATED AREA COVERAGE NAVIGATION DISPLAYS AND CONTROLS

. NONE

FAA-RD-115-7-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 152 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

UTILITY OF SELF-CONTAINED NAVIGATION SYSTEMS IN THE DOMESTIC ENVIRONMENT

. NONE

FAA-RD-115-17-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 153 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

UTILITY OF SELF-CONTAINED NAVIGATION SYSTEMS IN THE DOMESTIC ENVIRONMENT - T EST DOPPLER RADAR NAVIGATION EQUIPMENT AND PROCEDURES

. NONE

FAA-RD-115-17-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 156 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NEW COMMON SYSTEM SHORT DISTANCE NAVAID - DETERMINE MOST FEASIBLE REPLACEMENT FOR THE VORTAC SYSTEM

. NONE

FAA-RD-115-20-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 157 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STANDARD TIME-REFERENCED SYSTEM - D ETERMINE ADVANTAGES GAINED FROM AN ACCURATE TIME REFERENCING SYSTEM

. NONE

FAA-RD-115-21-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 161 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

GENERAL PURPOSE DME TRANSPONDER

. NONE

FAA-RD-115-24-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 162 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

GENERAL PURPOSE DME TRANSPONDER

. NONE

FAA-RD-115-24-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 163 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

COMPATIBLE MAXIMUM ACCURACY DME SYSTEM - DEVELOP ENGINEERING MODEL COMPATIBLE MAXIMUM ACCURACY DME SYSTEM

. NONE

FAA-RD-115-25-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 164 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

COMPATIBLE MAXIMUM ACCURACY DME SYSTEM

FAA-RD-115-25-E
/65- / . NONE

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 165 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PRECISION VOR - DEVELOP PRECISION VOR
. NONE

FAA-RD-115-27-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 166 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PRECISION VOR - ENVIRONMENTAL DEVELOPMENT OF PRECISION VOR
. NONE

FAA-RD-115-27-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 167 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DOPPLER VOR TRANSMITTERS - DEVELOP IMPROVED DOPPLER VOR TRANSMITTERS

. NONE

FAA-RD-115-29-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 168 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DOPPLER VOR ANTENNA SYSTEM - DEVELOP IMPROVED DOPPLER VOR ANTENNA SYSTEM

. NONE
FAA-RD-115-30-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 169 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DOPPLER VOR ANTENNA SYSTEM

. NONE

FAA-RD-115-30-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 170 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NO. 2 EXPERIMENTAL DOPPLER VOR TEST FACILITY

. NONE

FAA-RD-115-31-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 171 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

HELICOPTER RHO/RHO NAVIGATION SYSTEM - D EVELOP RHO/RHO COMPUTER AND DISPLAY FOR HELICOPTERS
. NONE

FAA-RD-115-33-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 172 1 FIELD 13F, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

HELICOPTER RHO/RHO NAVIGATION SYSTEM - H ELICOPTER RHO/RHO COMPUTER AND DISPLAY

. NONE

FAA-RD-115-33-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 173 1 FIELD 13F, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRBORNE RADAR FOR HELICOPTER NAVIGATION - ADAPTATION OF AIRBORNE RADAR FOR HELICOPTER NAVIGATION

. NONE

FAA-RD-115-34-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 174 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRBORNE RADAR FOR HELICOPTER NAVIGATION

. NONE

FAA-RD-115-34-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 175 1 FIELD 17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

UNIQUE V/STOL NAVIGATION SYSTEM - V/STOL NAVIGATION SYSTEM RESEARCH

. NONE

FAA-RD-115-37-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 176 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVED CONVENTIONAL VOR ANTENNA - D EVELOP IMPROVED CONVENTIONAL VOR ANTENNA

. NONE

FAA-RD-115-42-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 177 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOP SITING CRITERIA FOR DOPPLER VOR/TACAN

. NONE

FAA-RD-115-46-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 178 1 FIELD 9+, 9A,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

TACAN TRANSMITTER SPECTRUM IMPROVEMENTS

. NONE

FAA-RD-115-47-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 179 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DOPPLER VOR MONITORING - DEVELOP DOPPLER VOR MONITORING

. NONE
FAA-RD-115-51-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 180 1 FIELD 17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MONITORING CONFIGURATION

. NONE
FAA-RD-115-52-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 181 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ENROUTE FACILITY CHECKING UTILIZING RADAR TRACKS - FEASIBILITY OF USING RADAR TRACKS FOR ENROUTE FACILITY CHECK

. NONE

FAA-RD-511-2-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 182 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

IMPROVED TACAN/DME MONITOR

. NONE

FAA-RD-521-2-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 183 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SNOW EFFECTS ON VORTAC PERFORMANCE - D EVELOPMENT OF EQUIPMENT TO MINIMIZE SNOW EFFECTS ON VORTAC PERFORMANCE

. NONE

FAA-RD-521-4-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 184 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SNOW EFFECTS ON VORTAC PERFORMANCE - I NVESTIGATION OF SNOW EFFECTS ON VORTAC PERFORMANCE

. NONE

FAA-RD-521-4-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 185 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SNOW EFFECTS ON VORTAC PERFORMANCE - E VALUATION OF EQUIPMENT TO MINIMIZE SNOW EFFECTS ON VORTAC PERFORMANCE

. NONE

FAA-RD-521-4-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 187 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

USER AIRBORNE VOR/TACAN/DME RECEIVER PERFORMANCE - SURVEY OF

. NONE
FAA-RD-521-5-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 188 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

VOR/TACAN/DME RECEIVER ACCURACY TEST SYSTEM - ANALYSIS AND DEVELOPMENT

. NONE
FAA-RD-521-6-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 189 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PREPARATION OF SPECIFICATIONS FOR FY-1964 F+E PROGRAM - PREPARATION OF ENVIRONMENTAL SPECIFICATIONS FOR SHORT DISTANCE NAVIGATION FA

. NONE
FAA-RD-115-70-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 190 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PREPARATION OF SPECIFICATIONS FOR FY-1965 F+E PROGRAM - PREPARATION OF ENVIRONMENTAL SPECIFICATIONS FOR SHORT DISTANCE NAVIGATION FA

. NONE
FAA-RD-115-71-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 191 1 FIELD 9+,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

LORAN SYSTEMS SIMULATOR - DEVELOP LORAN SYSTEMS SIMULATOR

. NONE
FAA-RD-116-5-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 192 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INVESTIGATE LORAN C RECEIVERS FOR CIVIL USE - PROCURE AN/APN-152 LORAN C RECEIVERS

. NONE
FAA-RD-116-6-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 193 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

INVESTIGATE LORAN C RECEIVERS FOR CIVIL USE - EVALUATE LORAN C RECEIVERS FOR CIVIL USE

. NONE

FAA-RD-116-6-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 194 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF LONG DISTANCE VHF COMMUNICATIONS SYSTEM - DEVELOP AND INSTALL EXPERIMENTAL LONG DISTANCE VHF COMM. EQUIPMENTS

. NONE

FAA-RD-116-10-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 195 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF LONG DISTANCE VHF COMMUNICATIONS SYSTEM - LONG DISTANCE VHF COMMUNICATIONS SYSTEM TESTS

. NONE

FAA-RD-116-10-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 196 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SELF-CONTAINED NAVIGATION SYSTEM - I NERTIAL NAVIGATION SYSTEM INVESTIGATION

. NONE

FAA-RD-116-11-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 197 1 FIELD 9+,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIRBORNE NAVIGATION COMPUTERS - DEVELOP AIRBORNE COORDINATE CONVERTER

. NONE

FAA-RD-116-12-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 198 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATOMIC CLOCK NAVIGATION SYSTEM INVESTIGATION - DETERMINE FEASIBILITY OF USING ATOMIC CLOCK FOR LODISNAV

. NONE

FAA-RD-116-14-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 199 1 FIELD 13F, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ADVANCED NAVIGATION TECHNIQUES - FOR LODISNAV

. NONE

FAA-RD-116-30-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 201 1 FIELD 17G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PREPARATION OF SPECIFICATIONS FOR FY-1964 F+E PROGRAM - PREPARATION OF ENVIRONMENTAL SPECIFICATIONS FOR LONG DISTANCE NAVIGATION FFF

. NONE

FAA-RD-116-70-E
/65- /

ZKD 203 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADIO FREQUENCY INTERFERENCE - RADIO FREQUENCY INTERFERENCE SYSTEM DEVELOPMENT

. NONE

FAA-RD-541-1-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 204 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ILS FLIGHT INSPECTION GUIDE LIGHT - ILS FLIGHT INSPECTION GUIDE LIGHT DEVELOPMENT

. NONE

FAA-RD-541-3-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 205 1 FIELD 6B, 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

BASIC FLIGHT INSPECTION SYSTEM - BASIC FLIGHT INSPECTION SYSTEM DEVELOPMENT

. NONE

FAA-RD-541-4-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 206 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FLIGHT INSPECTION TEST AND CALIBRATION EQUIPMENT - FLIGHT INSPECTION TEST AND CALIBRATION EQUIPMENT DEVELOPMENT

. NONE
FAA-RD-541-5-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 207 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR FLIGHT INSPECTION - PRIMARY AND SECONDARY RADAR FLIGHT INSPECTION EQUIPMENT

. NONE
FAA-RD-541-7-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 208 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SEMI-AUTOMATIC FLIGHT INSPECTION (SAFI) SYSTEM - DEVELOPMENT OF TACAN RECEIVERS FOR SAFI

. NONE
FAA-RD-542-1-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 209 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF FIFTEEN CYCLE RECORDER AND TACAN JITTER ELIMINATOR

. NONE
FAA-RD-543-1-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 210 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF TACAN JITTER ELIMINATOR

. NONE
FAA-RD-543-1-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 211 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PREPARATION OF SPECIFICATIONS FOR FY-1964 F+E PROGRAM - PREPARATION OF ENVIRONMENTAL SPECIFICATION FOR FLIGHT INSPECTION EQUIPMENT

R. F. FRAKES
FAA-RD-540-070-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 212 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF ATC SEPARATION CRITERIA

. NONE
FAA-RD-101-25-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 213 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF ATC SEPARATION CRITERIA - SIMULATION OF A FINAL APPROACH SPACING CONCEPT USING A MANUAL COMPUTER

. NONE

FAA-RD-101-25-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 214 1 FIELD 22+,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC CONCEPTS FOR SUPERSONIC AND HYPERSONIC VEHICLES

. NONE
FAA-RD-101-28-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 215 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC CONCEPTS FOR SUPERSONIC AND HYPERSONIC VEHICLES - LANGLEY - NAFEC SIMULATOR TIE-IN AND SIMULATION

. NONE

FAA-RD-101-28-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 216 1 FIELD 9+,22C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SIMULATION OF ATCRBS CODING PLAN

. NONE

FAA-RD-101-143-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 217 1 FIELD 9+,22C

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SIMULATION OF TRANSPONDER DERIVED ALTITUDE DATA

. NONE

FAA-RD-101-143-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 218 1 FIELD 5C,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

SIMULATION OF AUTOMATIC ALTITUDE AND DISCRETE IDENTITY REPORTING

. NONE

FAA-RD-101-143-X-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 221 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EUROCONTROL SIMULATION - EUROCONTROL UPPER AIRSPACE SIMULATION

. NONE

FAA-RD-101-173-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 223 1 FIELD 9+,12A, 9D

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ADVANCED ATC SYSTEM CONCEPT AND TECHNIQUE INVESTIGATIONS

. NONE

FAA-RD-101-200-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 226 1

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FUTURE EQUIPMENT CONFIGURATION STANDARDS FOR ARTC CENTERS

. NONE

FAA-RD-101-910-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 229 1 FIELD 9+,12A,22C, 9D

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

THEORETICAL RESEARCH INTO ATC SYSTEMS

. NONE

FAA-RD-102-10-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 232 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC FACILITY PROCUREMENT SPECIFICATIONS FOR FY-1964

. NONE

FAA-RD-101-70-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 233 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC FACILITY PROCUREMENT SPECIFICATIONS FOR FY-1965

. NONE

FAA-RD-101-71-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 234 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

BASIC DEVELOPMENT - ADP/ENROUTE EQUIPMENTS

. NONE

FAA-RD-103-101-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 235 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

STUDY THE FEASIBILITY OF ESTABLISHING A CONTROL DATA PROCESSING COMPLEX

. NONE

FAA-RD-103-501-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 236 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO ATC DATA PROCESSING SYSTEM

. NONE

FAA-RD-103-501-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 237 1 FIELD 9+,12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOP, DESIGN OR MODIFY DATA PROCESSING SUB-SYSTEM OF THE ENGINEERING MODEL

. NONE

FAA-RD-104-126-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 238 1 FIELD 9+,12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PROVIDE PROGRAMMING AND EXPERIMENTAL SUPPORT OF THE DATA PROCESSING AND DISPLAY SU

. NONE

FAA-RD-104-126-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 239 1 FIELD 9+,12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF THE DATA PROCESSING SUBSYSTEM - NAS

. NONE

FAA-RD-104-126-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 240 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOP AND ASSEMBLE A PROTOTYPE OF AN ADVANCED RADAR TRAFFIC CONTROL SYSTEM

. NONE

FAA-RD-105-200-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 242 1 FIELD 9+,12A,22C, 9D

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

PROVIDE GUIDANCE AND MONITOR CONTRACTOR PERFORMANCE IN THE DEVELOPMENT OF A COMPUTER COMPILER

. NONE

FAA-RD-105-600-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 243 1 FIELD 9+,12A,22C, 9D

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATE AN ATC PROBLEM-ORIENTED LANGUAGE COMPUTER COMPILER

. NONE

FAA-RD-105-600-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 244 1 FIELD 9+,12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ADVANCED TECHNIQUES FOR DATA PROCESSING

. NONE

FAA-RD-106-76-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

206-320 O - 66 - C

ZKD 245 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT IN-SERVICE MODIFICATIONS TO ENROUTE DATA DISPLAY

. NONE

FAA-RD-103-500-D-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 246 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATIONS TO ENROUTE DATA DISPLAY SYSTEM - IMPROVED SCAN CONVERTER TUBE

. NONE

FAA-RD-103-500-D-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 247 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DEVELOPMENT OF CENTRAL CLOCK SYSTEM

. NONE

FAA-RD-103-500-D-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 248 1 FIELD 10B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO ENROUTE DATA DISPLAY SYSTEM, FLIGHT STRIP HOLDER DISTRIBUTION SYSTEM

. NONE

FAA-RD-103-500-E-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 249 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CONSOLE MAP PROJECTION SYSTEM

. NONE

FAA-RD-103-500-E-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 250 1 FIELD 10B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

EVALUATION OF THE MODIFIED FLIGHT STRIP LOADER

. NONE

FAA-RD-103-500-V-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 251 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATIONS TO ENROUTE DATA DISPLAY SYSTEM - EVALUATION OF ATC CENTRAL CLOCK SYSTEM

. NONE

FAA-RD-103-500-V-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 252 1 FIELD 10B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATIONS TO ENROUTE DATA DISPLAY SYSTEM - EVALUATION OF A FLIGHT STRIP HOLDER CHAIN CONVEYOR SYSTEM

. NONE
FAA-RD-103-500-V-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 253 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NAS - DATA DISPLAY SUBSYSTEM - NAS - M OSAIC GENERATOR

. NONE
FAA-RD-104-127-D-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 254 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NAS - DATA DISPLAY SUBSYSTEM - NAS - T ELEVISION VIDEO MAPPER

. NONE
FAA-RD-104-127-D-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 255 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NAS - DATA DISPLAY SUBSYSTEM - NAS - SCAN CONVERSION EQUIPMENT

. NONE
FAA-RD-104-127-D-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 256 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NAS - DATA DISPLAY SUBSYSTEM - NAS - T ABULAR DISPLAY MODULES

. NONE
FAA-RD-104-127-D-4
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 257 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

NAS - DATA DISPLAY SUBSYSTEM - NAS - D IGITAL TO ANALOG AND SYMBOL GENERATOR FOR SCAN CONVERSION EQUIPMENT

. NONE
FAA-RD-104-127-D-5
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 258 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA DISPLAY SUBSYSTEM - NAS - DATA DISPLAY SUBSYSTEM - NAS - PICTORIAL DISPLAYS AND PREDICTED SITUATION DISPLAYS

. NONE

FAA-RD-104-127-D-6
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 259 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA DISPLAY SUBSYSTEM - NAS - DATA DISPLAY SUBSYSTEM - NAS - DATA DISPLAY GENERATOR

. NONE

FAA-RD-104-127-D-7
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 260 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA DISPLAY SUBSYSTEM - NAS - DATA DISPLAY SUBSYSTEM - NAS - DISPLAY CONSOLES

. NONE
FAA-RD-104-127-D-8
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 261 1 FIELD 9+,12A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA DISPLAY SUBSYSTEM - NAS - PROVIDE EXPERIMENTAL SUPPORT OF THE DATA DISPLAY SUBSYSTEM (NAS)

. NONE
FAA-RD-104-127-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 262 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

DATA DISPLAY SUBSYSTEM - NAS - EVALUATION OF THE DATA DISPLAY SUBSYSTEM - NAS

. NONE

FAA-RD-104-127-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 264 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - M ODIFICATION TO TERMINAL DISPLAYS - ASR-4 DVST AND A/N SYMBOL MODIFICATIONS

. NONE

FAA-RD-104-524-D-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 265 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - M ODIFICATION TO TERMINAL DISPLAYS - ASDE BRIGHT DISPLAY

. NONE

FAA-RD-104-524-D-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 266 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - M ODIFICATION TO TERMINAL DISPLAYS - TV DATA TRANSFER SYSTEM

. NONE

FAA-RD-104-524-D-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 267 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - M ODIFICATION TO TERMINAL DISPLAYS - BRIGHT DISPLAY FOR PRECISION APPROACH RADAR

. NONE

FAA-RD-104-524-D-4
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 268 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - SMALL BRIGHT TOWER DISPLAY

. NONE

FAA-RD-104-524-D-5
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 269 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - E VALUATION OF A TV DATA TRANSFER SYSTEM

. NONE

FAA-RD-104-524-V-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 270 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - E VALUATION OF A MODIFIED RBDE-5 DISPLAY FOR TERMINAL FACILITIES

P. J. MARTIN

FAA-RD-104-524-V-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 271 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

MODIFICATION TO TERMINAL DISPLAYS - M ODIFICATION TO TERMINAL DISPLAYS - H ONOLULU TERMINAL IMPROVEMENT PROGRAM

. NONE

FAA-RD-104-524-S
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 272 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

CHARACTER GENERATION AND DISPLAY - D EVELOP CHARACTER GENERATION EQUIPMENT FOR IN-SERVICE DISPLAYS

. NONE

FAA-RD-105-550-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 273 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ADVANCED TECHNIQUES FOR DATA DISPLAY - S URVEY AND ANALYSIS OF ADVANCED DATA DISPLAY TECHNIQUES

. NONE

FAA-RD-106-75-R
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 274 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

ATC DATA DISPLAY PROCUREMENT SPECIFICATIONS FOR FY-1964 - PREPARATION OF ATC DATA DISPLAY PROCUREMENT SPECIFICATIONS FOR FY-1964

. NONE

FAA-RD-104-70-E
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 275 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

AIR HEIGHT SURVEILLANCE RADAR - D EVELOPMENT OF AHSR-1 (PROCUREMENT + INSTALLATION OF MICROWAVE LINK)

. NONE
FAA-RD-107-1-D
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 276 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - RADAR INTERFERENCE REDUCTION

. NONE
FAA-RD-107-2-D-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 277 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - DUAL DIVERSITY

. NONE
FAA-RD-107-2-D-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 278 1 FIELD 9+

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - MTI DEVICES

. NONE

FAA-RD-107-2-D-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 279 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - PASSIVE RADAR ENHANCER

. NONE
FAA-RD-107-2-D-4
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 280 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - RADAR INTERFERENCE REDUCTION

. NONE
FAA-RD-107-2-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 281 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - DUAL DIVERSITY

. NONE
FAA-RD-107-2-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 282 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - MTI DEVICES

. NONE
FAA-RD-107-2-X-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 283 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - PASSIVE RADAR ENHANCER

. NONE
FAA-RD-107-2-X-4
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 284 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - EVALUATION OF RADAR INTERFERENCE EQUIPMENT - RECEIVER AND TRANSMITTER FIXES FOR INTERFERENCE REDUCTION

. NONE
FAA-RD-107-2-V-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 285 1 FIELD 9+, 9A

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

RADAR IMPROVEMENTS - EVALUATION OF RADAR INTERFERENCE EQUIPMENT - EVALUATION OF MTI DEVICES

. NONE

FAA-RD-107-2-V-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

20. Physics

GSS 470 1 FIELD 5A

AMER INST PHYSICS, NEW YORK

SOURCES FOR HISTORY OF QUANTUM PHYSICS

J. A. WHEELER, F. HUND, J. A. WHEELER

NSF-GS-389
7/65- 7/66

NSF-SOCIAL SCIENCES DIVISION

GUE 130 FIELD 7D, 7A,20J,18A

UNION CARBIDE CORP TUX, NEW YORK

SLOW NEUTRON INELASTIC SCATTERING STUDIES OF WATER AND IONIC SOLUTIONS

G. J. SAFFORD, P. A. KING, A. W. NAUMANN

/66- /

INTERIOR-OFFICE OF SALINE WATER

GUW 195 FIELD 20D

UNIV OF TENNESSEE, SCHOOL OF ENGINEERING, ENGINEERING MECHANICS, TENNESSEE

TURBULENT MIXING IN SUBMERGED FLUID JETS

F. N. PEEBLES

INT-WR-A-001-TENN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 198 FIELD 13G,12A, 8E,20D

, UNKNOWN STATE AND IN

A RECONSIDERATION OF FLOW OF LIQUIDS IN OPEN CHANNELS

.

INT-WR-A-003-ALA
7/65- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GYE 110132 FIELD 13G,13B,20D

UNIVERSITY OF IDAHO, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, IDAHO

EFFECT OF EXTERNAL AIR PRESSURE ON LIQUID FLOW THROUGH A POROUS MEDIUM

G. L. BLOOMSBURG

AG-IDA-H-512
7/64- 6/65

AGRICULTURE-DEPT OF AGRICULTURE

JKC 2 FIELD 13G,20D

COLORADO STATE UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, COLORADO

HYDRAULIC INVESTIGATION OF FLEXIBLE TUBES

V. M. YEVDJEVICH

1/65-12/65

KALIUM CHEMICAL COMPANY

NDE 1 1 FIELD 13G,20D

UNIVERSITY OF DELAWARE, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, DELAWARE

THE TURBULENT FLOW OF NON-NEWTONIAN SUSPENSIONS IN PIPES

I. ZANDI, F. HOMAYOUNFAR, K. MURTHY R. RUST, M. VAHIDI, S. ZANDYAZDANI

/66- /

DELAWARE, UNIVERSITY OF

NG 8 2 FIELD 20M,20D

HOT-WIRE PHYSICS IN LIQUIDS

J. W. DELLEUR, C. L. LIU

9/65- 8/66

PURDUE UNIVERSITY

NG 79 FIELD 13G,20D

PURDUE UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, INDIANA

MECHANISM OF TURBULENCE IN FREE SURFACE FLOW

J. W. DELLEUR, G. H. TOEBES

9/63- 8/64

PURDUE UNIVERSITY

NGI 6 FIELD 20D

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

FLOW THROUGH POROUS MEDIA

G. H. SLAUGHTER

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 11 FIELD 13G,20D

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

EFFECT OF TURBULENCE ON DRAG ON SPHERES ADJACENT TO A BOUNDARY

C. S. MARTIN

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 18 FIELD 13G,20D

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

CROSS-CHANNEL DIFFUSION

M. R. CARSTENS, R. R. WRIGHT

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

21. Propulsion and Fuels

ZKD 32 1 FIELD 18,21B,20M,11G

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FIRE RESISTANT MATERIALS IN POWERPLANT INSTALLATIONS - CRITERIA OF FIRE RESISTANCE REQUIREMENTS

. NONE

FAA-RD-311-2-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 33 1 FIELD 21B,20M,11G,11F

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

FIRE RESISTANT MATERIALS IN POWERPLANT INSTALLATIONS - FIRE RESISTANT MATERIALS IN POWER PLANT INSTALLATIONS

. NONE

FAA-RD-311-2-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 54 1 FIELD 21B,14B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

POWER PLANT FIRE TESTS - POWER PLANT FIRE TESTS - FULL SCALE TURBO-FAN ENGINE FIRE TESTS

. NONE

FAA-RD-321-15-X-1
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 55 1 FIELD 1B,10B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

POWER PLANT FIRE TESTS - MODEL FIRE TESTS

. NONE

FAA-RD-321-15-X-2
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 56 1 FIELD 1B,10B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

POWER PLANT FIRE TESTS - POWER PLANT FIRE TESTS OF FULL-SCALE SMALL ENGINE INSTALLATIONS

. NONE

FAA-RD-321-15-X-3
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 57 1 FIELD 1B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

THRUSTMETERS - DIRECT READING THRUSTMETER FOR TURBOJET ENGINES

. NONE

FAA-RD-326-1-X
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

ZKD 59 1 FIELD 1B,10B

US, FED AV AGCY, SYST RES + DEV SERV, DIST OF COLUMBIA

HAZARD OF CARBON MONOXIDE IN EXHAUST HEAT EXCHANGERS - EVALUATION OF EXISTING HEAT EXCHANGERS FOR CARBON MONOXIDE HAZARDS

. NONE

FAA-RD-328-1-V
/65- /

FAA-SYSTEMS RES + DEVEL SERVICE

TECHNICAL ABSTRACT BULLETIN

1/2. AERONAUTICS

AD-625 710 Fld. 1/2, 9/2
CFSTI Prices: HC $1.00 MF $0.50
FRANKFORD ARSENAL PHILADELPHIA PA PROPELLANT ACTUATED DEVICES DIV
MATHEMATICAL STIMULATION OF HELICOPTER EMERGENCY EGRESS TRAJECTORIES.
Memo. rept.,
by Leonard A. DeStefano. Nov 65, 25p. Rept. no. MR-M66-12-1
Unclassified report

Descriptors: (*Programming (Computers), Aviation safety), (*Helicopters, Flight paths), Hatches, Equation of motion, Mathematical models, Cartridges (Pad), Army equipment

The basic equations of motion for a point mass under the influence of gravity, aerodynamic drag, and rocket forces are used to simulate a three-dimensional, three-degree of freedom, helicopter emergency egress trajectory. The resulting equations of motion were solved by a fourth order Runge Kutta method, programmed in Fortran for the Univac Solid State 90 digital computer. Included in this report is the computer program which was used to obtain a numerical solution to the equations of motion, the solution to three test cases, and a comparison with an experimental trajectory. (Author)

AD-625 722 Fld. 1/2, 1/3
CFSTI Prices: HC $3.00 MF $0.75
NAVAL AIR TEST CENTER PATUXENT RIVER MD
FLIGHT TEST EVALUATION OF THE UF-XS JAPANESE STOL SEAPLANE.
Final technical rept.,
by Nicholas J. Vagianos, and Eugene C. Rooney.
25 Aug 64, 59p. Rept. no. FT2121-031R-64
Task RA1200005/201-1/WS417A0-0
Unclassified report

Descriptors: (*Short take-off planes, Flight testing), (*Seaplanes, Flight testing), Japan, Hydrodynamic characteristics, Stability, Pitch (Motion), Take-off, Landings

The UF-XS Japanese STOL Seaplane was evaluated to determine the flying qualities in configurations PA, L, and TO at approach speeds in the vicinity of 55 kt and the hydrodynamic characteristics while on the water. The NASA Ames simulator showed good correlation with the airplane's aerodynamic characteristics. The airplane has neutral to unstable static longitudinal stability, weak directional stability, large adverse yaw, a long period moderately damped Dutch Roll mode, a divergent spiral mode, and trims for flight in a 13 degree left sideslip. An automatic stabilization equipment (ASE) makes the static longitudinal stability and spiral modes positive but does not improve the remaining items. Take-off and landing touchdown speed is 50 kt. The airplane has a hydrodynamic stable elevator range of 20 to 35 degrees up elevator. A 'digging in' and slight 'porpoising' tendency is exhibited at elevator positions less than 20 degrees. The airplane possesses good spray characteristics. The mission capability of a STOL seaplane should greatly improve with reduction in takeoff and landing speed; however, evaluation of the airplane at lower speeds was not possible due to several airplane limitations. (Author)

AD-625 721 **See Fld. 17/7**

1/3. AIRCRAFT

AD-625 816 Fld. 1/3, 11/9, 20/11
CFSTI Prices: HC $4.00 MF $1.00
BARRY CONTROLS INC WATERTOWN MASS
DESIGN GUIDE FOR POLYURETHANE FOAM ISOLATION SYSTEMS.
by P. C. Calcaterra. 2 Dec 65, 124p. Rept. no. Barry-101
Contract N600 (19)59898
NADC-AE 6522
Unclassified report

Descriptors: (*Vibration isolators, Expanded plastics), (*Expanded plastics, Vibration isolators), (*Isocyanate plastics, Expanded plastics), Aircraft equipment, Jet planes, Buckling (Mechanics), Performance (Engineering), Shock resistance

The advantages of buckling isolators over presently used military standard isolators for the protection of equipment aboard high performance jet aircraft are discussed. The dynamic performance of various foams is compared to the theoretical behavior of buckling isolators based on the experimental results obtained with polyurethane foams. Design guides are presented for the use of polyurethane foams in multifunctional vibration and shock isolation systems based on the experimentally determined dynamic properties of the foam material. Results of tests performed on 1 ATR (B1-D1) size electronic equipment bases, designed and manufactured in accordance with design curves generated for a particular polyester foam, are presented and indicate the suitability of optimizing the use of a particular foam in an isolation system which is to meet specific performance requirements. General manufacturing and quality control techniques applicable to foam isolation systems are discussed. Recommendations for further work are made regarding the generation of design curves for other foams and the effect of combined environments on applicability of the design guides. (Author)

AD-625 818 Fld. 1/3
CFSTI Prices: HC $4.00 MF $0.75
HILLER AIRCRAFT CORP PALO ALTO CALIF
HEAVY-LIFT TIP TURBOJET ROTOR SYSTEM. VOLUME I.
Summary rept.
1965, 113p. Rept. no. ER-64-41
Contract DA-44-177-AMC-25 (T) Task 1M121401D14412
USAAVLABS TR-64-68A
Unclassified report

Descriptors: (*Helicopter rotors, Design), Helicopters, Turbojet engines, Lift, Performance (Engineering), Weight, Stability

The study of a tip-turbojet-powered rotor system for a heavy-lift helicopter, which is presented in thirteen volumes, is summarized. Included under this general subject are studies on parametric design, performance, structures and dynamics, wind tunnel, preliminary design, weight and balance, stability, and power plant. (Author)

AD-625 819 Fld. 1/3, 21/5
CFSTI Prices: HC $4.00 MF $0.75
HILLER AIRCRAFT CORP PALO ALTO CALIF
HEAVY-LIFT TIP TURBOJET ROTOR SYSTEM. VOLUME II. PARAMETRIC DESIGN STUDY.
Engineering rept.
Oct 65, 104p. Rept. no. ER-64-42
Contract DA-44-177-AMC-25 (T) Task 1M121401D14412
USAAVLABS TR-64-68B
Unclassified report

See also AD-625 818.

Descriptors: (*Helicopter rotors, Design), Helicopters, Lift, Turbojet engines, Rotor blades (Rotary wings), Optimization, Weight, Aerodynamic characteristics, Configuration

The parametric analysis determines the optimum design parameters of a 24,000-lb.-payload helicopter powered by turbojet engines installed at the rotor blade tips. The method used determined a gross weight which would satisfy statistical component weight equations and aerodynamic equations simultaneously. The optimizing criterion was the minimum gross weight required to perform a specific mission. The results of the analysis indicate that the optimum configuration using the Continental Model 357-1 engine is a helicopter with (a) four blades, (b) two engines per blade, and (c) a cranetype fuselage. The optinum configuration with a generalized or 'rubber' engine is a helicopter with (a) three blades, (b) one engine per blade, and (c) a cranetype fuselage. (Author)

AD-625 820 Fld. 1/3
CFSTI Prices: HC $4.00 MF $1.00
HILLER AIRCRAFT CORP PALO ALTO CALIF
HEAVY-LIFT TIP TURBOJET ROTOR SYSTEM. VOLUME V. STRUCTURAL ANALYSIS.
Engineering rept.
Oct 65, 127p. Rept. no. ER-64-45
Contract DA-44-177-AMC-25 (T) Task 1M121401D14412
USAAVLABS TR-64-68E
Unclassified report

See also AD-624 814.

Descriptors: (*Helicopter rotors, Design), (*Rotor blades (Rotary wings), Design), Helicopters, Turbojet engines, Lift, Stresses

The report discusses stress calculations for major structural components of this system. Tip engine attachment hardware is also analyzed. (Author)

AD-625 821 Fld. 1/3, 21/5
CFSTI Prices: HC $3.00 MF $0.75
HILLER AIRCRAFT CORP PALO ALTO CALIF
HEAVY-LIFT TIP TURBOJET ROTOR SYSTEM. VOLUME IX. PERFORMANCE ANALYSIS.
Engineering rept.
Oct 65, 73p. Rept. no. ER-64-49
Contract DA-44-177-AMC-25 (T) Proj. DA-1M121401D14412
USAAVLABS TR-64-681
Unclassified report

See also AD-624 813.

Descriptors: (*Helicopter rotors, Design), (*Helicopters, Performance (Engineering)), Analysis, Lift, Turbojet engines, Configuration, Rotor blades (Rotary wings)

The report presents a performance and characteristics summary of the Model 1108 tip turbojet-powered heavylift helicopter. The configuration was selected from a parametric analysis (USAAVLABS Technical Report 64-68B). Standard performance methods are used, modified where necessary by factors peculiar to tip turbojet propulsion. (Author)

AD-625 822 Fld. 1/3
CFSTI Prices: HC $3.00 MF $0.75
HILLER AIRCRAFT CORP PALO ALTO CALIF
HEAVY-LIFT TIP TURBOJET ROTOR SYSTEM. VOLUME X. STABILITY AND CONTROL.
Engineering rept.
Oct 65, 89p. Rept. no. ER-64-50
Contract DA-44-177-AMC-25 (T) Proj. DA-1M121401D14412
USAAVLABS TR-64-68J
Unclassified report

See also AD-625 821.

Descriptors: (*Helicopter rotors, Design), (*Helicopters, Performance (Engineering)), Stability, Control, Turbojet engines, Lift, Specifications, Handling

The report discusses the results of a stability and control analysis of a large crane-type helicopter powered by a tip-mounted turbojet system. Specification MIL-H-8501A was used as a guide for criteria. Specification criteria were met; however, for improvements in handling qualities, a stability augmentation system is recommended. (Author)

AD-625 823 Fld. 1/3, 21/5
CFSTI Prices: HC $3.00 MF $0.50
HILLER AIRCRAFT CORP PALO ALTO CALIF
HEAVY-LIFT TIP TURBOJET ROTOR SYSTEM. VOLUME XIII. PRELIMINARY MODEL SPECIFICATION FOR CONTINENTAL MODEL 357-1 ENGINE.
Technical rept.
Oct 65, 53p. Contract DA-44-177-AMC-25 (T)
Task 1M121401D14412
USAAVLABS TR-64-68M

Unclassified report

Prepared in cooperation with Continental Aviation and Engineering Corp., Detroit, Mich. See also AD-624 822.

Descriptors: (*Helicopter rotors, Design), (*Turbojet engines, Specifications), Rotor blades (Rotary wings), Helicopters, Lift, Models (Simulations), Performance (Engineering)

The report contains Continental Preliminary Model Specification No. 2253-A, which contains requirement, capability, and engine performance data on the Continental Model 357-1 (1700-pound thrust) turbojet engine for helicopter rotor-tip mounting. (Author)

AD-625 901 Fld. 1/3, 9/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
CURRENT-RATING TABLES FOR BUNDLED AIRCRAFT CABLES CARRYING CONTINUOUS D-C CURRENTS,
by Milton Schach. Mar 55, 26p. Rept. no. NRL-442
Proj. AF-6060

Unclassified report

Descriptors: (*Electric cables, Specifications), (*Aircraft equipment, Electric cables), Direct current, Tables, Weight, Selection

A tabular method for rating bundled cables carrying continuous d-c currents was devised. The tabular method can be applied to any given set of cables, e.g., MIL-W-5086, MIL-W-7072, etc., for a wide range of bundle installation and environmental conditions. The method of computing and compiling the necessary data is explained. An example of one pair of cable-rating and -selection tables is given along with illustrations which show their use in finding the correct cable sizes when the currents are given and in finding the currents when the bundled cables are given. The tables are applied to a number of bundles and the results compared with MIL-W-5088A ratings. The results show that the latter may seriously underload or overload cables in bundles. Application of the proposed rating methods will lead to the lowest cable weight consistent with the safety of the aircraft. It is recommended that the tabular method be applied to several aircraft to gain needed information and experience before incorporation of the tables into the cable-rating specification is effected. (Author)

AD-625 907 Fld. 1/3, 9/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
CURRENT RATING OF AIRCRAFT CABLES FOR A-C SYSTEMS,
by Milton Schach. Oct 55, 22p. Rept. no. NRL-535
Proj. AF-6060

Unclassified report

Descriptors: (*Electric cables, Specifications), (*Aircraft equipment, Electric cables), Alternating current, Configuration, Frequency, Resistance (Electrical)

An experimental investigation was made to determine the significance of the skin and proximity effect for the installation and current rating of aircraft cables in threephase alternating-current systems with frequencies up to 800 cycles per second. It was found that the effects are small for all cable sizes, configurations and number of cables per phase. In so far as the thermal limitation is controlling, cables in a-c systems may be installed as in d-c systems. The current rating methods proposed in NRL Memorandum Report 442 for d-c systems may be applied without modification to 400-cycle a-c systems. The same methods methods may be applied to 800-cycle systems provided that the higher a-c resistances be used in place of the d-c resistance. (Author)

AD-626 360 Fld. 1/3
CFSTI Prices: HC $7.00 MF $1.25
WRIGHT AIR DEVELOPMENT CENTER WRIGHT-PATTERSON AFB OHIO
PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM (1ST), 3-4 NOVEMBER 1965, WRIGHT PATTERSON AFB, OHIO.
1965, 375p.

Unclassified report

Descriptors: (*Vertical take-off planes, Symposia), (*Short take-off planes, Symposia), Design, Flight testing, Operation, Propellers (Aerial), Propulsion, Attitude control systems, Hovering, Tilt wings

The technical papers presented are grouped into the following three categories: (1) V/STOL aircraft design, (2) V/STOL subsystem design, and (3) V/STOL aircraft testing and operation. (Author)

AD-625 721 **See Fld. 17/7**

AD-625 722 **See Fld. 1/2**

AD-626 140 **See Fld. 10/2**

AD-626 141 **See Fld. 10/2**

AD-626 142 **See Fld. 10/2**

AD-626 481 **See Fld. 15/3**

1/4. AIRCRAFT FLIGHT INSTRUMENTATION

AD-626 036 Fld. 1/4, 5/5
CFSTI Prices: HC $2.00 MF $0.50
SYSTEMS TECHNOLOGY INC HAWTHORNE CALIF
EFFECTS OF NONLINEARITIES ON HUMAN OPERATOR TRACKING PERFORMANCE: A REVIEW OF THE LITERATURE.
Final rept. Sep 64-May 65,
by Richard J. Wasicko, and Raymond E. Magdaleno. Oct 65, 50p. Contract AF33 (615)-1782
Proj. AE-7184 Task 718402
AMRL TR-65-158

Unclassified report

Descriptors: (*Flight control systems, Human engineering), (*Performance (Human), Flight control systems), Nonlinear systems, Pilots, Display systems, Reviews

Available literature on the effects of system nonlinearities on human operator tracking performance is summarized. The reviewed reports include experimental investigations in the technical areas of human engineering and aircraft handling qualities. Pertinent information is presented on experimental details, types of it is concluded that the general state of knowledge in this area is unsatisfactory. Several nonlinearities (such as actuator rate limiting) important in aircraft manual control systems have not been experimentally investigated, and there is inadequate data on the influence of forcing function characteristics. (Author)

1/5. AIR FACILITIES

AD-626 150 Fld. 1/5, 11/5
CFSTI PricesMF $0.75
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
PORTABLE SURFACING FOR U. S. ARMY PIONEERTYPE RUNWAYS, LABORATORY AND ENGINEERING FIELD TESTS,
by S. G. Tucker. Nov 65, 89p. Rept. no. TR-3-700
Proj. DA-1-V-0-21701-A-046 Task 1-V-0-21701-A-046-05

Unclassified report

Availability: Available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., $0.75.

Descriptors: (*Runways, Cotton textiles), Portable, Plastic coatings, Vinyl plastics, Surfaces, Tests, Fastenings, Joints, Degradation, Foundation (Structures), Performance (Engineering), Soils, Moistureproofing, Adhesives, Mechanical properties, Maintenance, Damage

Laboratory and field tests were conducted on sewn panels of Tl, No. 8 cotton duck, vinyl-caoted membrane, fasteners, and adhesive joints to determine their performance and suitability when the membrane was placed directly on soil subgrades and used as a waterproof and dustproof surface on pioneer-type runways for operations of U. S. Army fixed-wing aircraft. In laboratory tests, the weight, tensile and teäring strengths, elongation, permeability, weathering of membrane, and resistance to flame, heat, cold, and fuel spillage were determined. Field tests consisted of exposing the sewn membrane panels connected with both fastener and adhesive joints to traffic of fixed-wing aircraft. The tests indicated that the membrane will provide a dustproof and waterproof runway surfacing for operations of the 0-1 Bird Dog, U-6 Beaver, and U-1A Otter with minor maintenance. Operations of the OV-1 Mohawk and CV-2 Caribou cause frequent damage to the surfacing, and daily maintenance is required. After approximately 2-1/2 years exposure to the weather, the tensile and tear strengths of the membrane had decreased about 34 and 63 percent, respectively. (Author)

AD-626 617 Fld. 1/5
CFSTI Prices: HC $3.00 MF $0.75
REPUBLIC AVIATION CORP FARMINGDALE N Y
FEASIBILITY STUDY ON THE DESIGN AND DEVELOPMENT OF A VTOL BLAST CONTROLLING PLATFORM.
Technical rept.,
by S. Bartha, and F. H. Ringler. Aug 65, 87p.
Rept. no. C-6091-05
Contract DA-22-079-eng-435 Proj. DA-1-D021701A047
AEWES 3-123

Unclassified report

Descriptors: (*Vertical take-off planes, Landing mats), (*Landing mats, Vertical take-off planes), (*Exhaust, Deflection), Model tests, Feasibility studies, Design, Aircraft engines, Jet engines

A concept was developed for a portable vertical take-off and landing blast diverting platform which would direct the exhaust blast away from the aircraft and into the air to prevent terrain errosion, hot gas reingestion, ground effects, and signature. The platform would be assembled on site from modular sections, each section containing deflector vanes and topped by a load bearing grid. The feasibility of this concept has been demonstrated by scale model testing. The results indicate that such a platform is efficient in conducting engine exhaust blast and accompanying entrained air way from

the aircraft. Significant reduction in thrust loss and lower surface temperature on the aircraft model were observed. (Author)

AD-626 580 See Fld. 11/2

2/1. AGRICULTURAL CHEMISTRY

AD-626 470 See Fld. 6/1

2/2. AGRICULTURAL ECONOMICS

AD-626 139 Fld. 2/2, 5/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
KHRUSHCHEV SANS REPROCHE: REVIEW OF BOOK BY SIDNEY I. PLOSS,
by Sidney I. Ploss. Jan 66, 7p. Rept. no. P-3290
TT 66-60200
Unclassified report

Book review of Conflict and Decision-Making in Soviet Russia: A Case Study of Agricultural Policy, 1953-1963, Princeton, 1965, 312p.

Descriptors: (*Agriculture, USSR), Government (Foreign), History, Economics, Decision making

The aims of Mr. Sidney I. Ploss are to identify the individuals, interest groups, and government bodies that have participated in important decisions and to analyze their attitudes and manoeuvres on such questions as the virgin lands program, abolition of machine tractor stations, conversions of collective farms into state farms, and decentralization of agricultural planning. Ploss is charged with accepting Krushchev as a 'good guy', disregarding evidence that casts doubt on Krushchev's competence and liberalism and imputing only base motives to his opponents.

AD-626 247 See Fld. 8/2

AD-626 265 See Fld. 2/4

AD-626 266 See Fld. 2/4

2/4. AGRONOMY AND HORTICULTURE

AD-626 265 Fld. 2/4, 2/2, 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
INTERUNIVERSITY CONFERENCE ON GEOBOTANICAL DISTRICTING OF THE USSR,
by L. N. Sobolev. 13 Dec 65, 4p. Rept. no. ACSI-I-7964-B
TT 66-60218
Unclassified report

Mezhvuzovskaya Konferentsiya po Geobotanicheskomu Raionirovaniyu SSSR, trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n3 p145-7 1965.

Descriptors: (*Agriculture, USSR), (*Plants (Botany), Distribution), Ecology, Environment, Geography, Classification, Scientific research, Economics, Symposia

From 21 to 24 December 1964, in the Moscow M.V. LOMONOSOV State University a conference was held whose goal was to introduce the scientific research results and methodological instructions worked out on the problems of geobotanical districting for a rational expolitation of the vegetable resources of the Soviet Union's area. The Conference heard about 30 papers of the representatives of different university educational establishments and scientific research institutes.

AD-626 266 Fld. 2/4, 2/2, 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
CONFERENCE ON GEOGRAPHICAL PROBLEMS OF FRUITING OF FOREST TREES, BUSHES AND BERRY PLANTS. (SOVESHCHANIE PO VOPROSAM GEOGRAFII PLODONOSHENIYA LESNYKH DREVESNYKH POROD, KUSTARNIKOV I YAGODNIKOV),
by V. V. Barykina, and Yu. A. Isakov. 1965, 4p.
Rept. no. ACSI-I-7964-C
TT 66-60219
Unclassified report

Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya, n3 p147-9 1965.

Descriptors: (*Agriculture, USSR), (*Plants (Botany), Geography), Ecology, Fruits, Forestry, Seeds, Economics, Symposia

On 28-30 November, 1964, in Moscow the Interdepartmental Conference on geographical Problems of Fruiting of Forest Trees, Bushes and Berry Plants was held. It discussed the importance of their crops in biocenoses and in national economy. The Conference was arranged by the Institute of Geography of the USSR Academy of Sciences and by the Moscow Society of Naturalists. Reports were devoted to the geography of crop capacity and periodicity of crops of more important forest trees, to the determination of the causes of periodicity and to the elaboration of methods of crop prognosis in its geographical aspect.

2/5. ANIMAL HUSBANDRY

AD-626 320 See Fld. 6/18

3/1. ASTRONOMY

AD-625 824 Fld. 3/1, 4/1
CFSTI Prices: HC $3.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH GEO-ASTRO PHYSICS LAB
EFFECT OF THE INTERPLANETARY MAGNETIC FIELD ON SOLAR NEUTRON-DECAY PROTONS,
by E. C. Roelof. Nov 65, 51p. Rept. no. D1-82-0484
Unclassified report

Also available from the author. Presented to the American Geophysical Union, Dallas, Tex., 3 Sep 65.

Descriptors: (*Solar radiation, Magnetic fields), (*Protons, Solar radiation), Transport properties, Neutrons, Solar flares, Cosmic rays, Neutron transport theory, Terrestrial magnetism, Van Allen radiation belt

Upper bounds, placed on steady-state and pulse (flare) outflow of neutrons above 1 MeV from the sun, are obtained by assuming that the neutron-decay protons diffuse in the interplanetary magnetic field in order to calculate the resultant proton fluxes from simple diffusion theory, and then comparing the theoretical fluxes with recent proton observations. Using the IMP-1 proton spectrum (20-75 MeV) it is shown that there is no significant contribution to the inner belt proton population in that energy range by steady neutron outflow in the first half of 1964, and perhaps as far back as 1961. For the same period and energy range, it is concluded that there could have been no higher steady outflow from the sun than 10 to the 22nd power neutrons/sec MeV. It is found that neutron-decay protons are insensitive indicators of the presence of neutrons in solar flares. On the order of 10 percent of flare particles at energies 1 to 100 MeV could be neutrons and yet their decay protons would cause only marginally observable modifications of the primary proton flux during the times of diffusion behavior at 1 AU, 0.5 AU, and 1.5 AU. (Author)

AD-625 910 Fld. 3/1
CFSTI Prices: HC $6.00 MF $1.25
NAVAL OBSERVATORY WASHINGTON D C
RECTANGULAR COORDINATES OF MERCURY 1800-2000,
by R. L. Duncombe, Z. Tufekcioglu, and G. Larson. 2 Apr 65, 218p. Rept. no. Circular no. 106
Unclassified report

Descriptors: (*Mercury (Planet), Celestial mechanics), (*Celestial mechanics, Mercury (Planet)), Trajectories, Position finding, Tables

The rectangular heliocentric equatorial coordinates in this circular are intended chiefly for use in the numerical integration of orbits of celestial bodies, natural or artificial, which approach closely to Mercury. They are referred to the mean equinox and equator of 1950.0. They have been calculated from Newcomb's general theory of the motion of Mercury (Astronomical Papers prepared for the use of the American Ephemeris and Nautical Almanac, volume VI, 1898), and are tabulated for every second day from J. D. 237 8492.5 to J. D. 245 2048.5. (Author)

AD-626 223 Fld. 3/1
CFSTI Prices: HC $1.00 MF $0.50
HARVARD COLL OBSERVATORY CAMBRIDGE MASS METEOR DEPT
A THEORETICAL STUDY OF METEORIC TRAJECTORIES AND PROCESSES, INCLUDING EXAMINATION OF THE INCIDENCE AND CHARACTERISTICS OF PHOTOGRAPHIC METEORS BY REDUCTION OF ABOUT 600 DATA POINTS.
Final rept. 1 Jun 63-30 Oct 65.
30 Oct 65, 16p. Contract NsG-460
Unclassified report

Descriptors: (*Meteors, Celestial mechanics), Trajectories, Photographic analysis, Astronomical data, Tables

A total of 415 pairs of Super-Schmidt Meteor Camera Films were measured and reduced. Of these 415 meteors, 363 were successfully processed through the computation of orbital elements. Tables and figures representing the major distillation of the results of these measures are presented.

AD-626 267 Fld. 3/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL OBSERVATORY WASHINGTON D C
OBSERVATIONS OF THE SUN, MOON, AND PLANETS SIX-INCH TRANSIT CIRCLE RESULTS,
by A. N. Adams, and D. K. Scott. 1 Jul 65, 9p.
Rept. no. Circular-108
Unclassified report

Descriptors: (*Sun, Position finding), (*Moon, Position finding), (*Planets, Position finding), (*Celestial mechanics, Solar systems), Astrrtronomical data, Optical trrtracking, Tables

This Circular contains positions of the sun, moon, and planets observed with the Six-inch Transit Circle between 7 July, 1964 and 24 December, 1964. These results are provisional. Definitive results will be published later in a volume of Publications of the U. S. Naval Observatory.

3/2. ASTROPHYSICS

AD-625 688 Fld. 3/2
RICE UNIV HOUSTON TEX DEPT OF SPACE SCIENCE
RADIOACTIVITY IN SUPERNOVA REMNANTS.
by D. D. Clayton, and W. L. Craddock. 18 Jan 65, 13p. Contract AF-AFOSR-855-65
AFOSR 65-1824
Unclassified report

Availability: Published in The Astrophysical Journal v142 n1 p189-200 Jul 1 1965. Copies to DDC users only.

Descriptors: (*Supernovae, Fission products), Astrophysics, Thermonuclear reactions, Radioactivity

AD-625 713 Fld. 3/2
CFSTI Prices: HC $2.00 MF $0.50
SACRAMENTO PEAK OBSERVATORY SUNSPOT N MEX
OBSERVATIONS ON SOLAR FLARES,
by John T. Jefferies, Frank Q. Orrall, Josip Kleczek, Hermann U. Schmidt, and Anton Bruzek. Jun 65, 47p. Contract AF19(604)-7993 ,AF19(604)-6664 Proj. AF-7649 Task 764906
AFCRL 65-399,AFCRL ,AFCRL SR-26
Unclassified report

Pub. in Proceedings of the AAS-NASA Symposium on the Physics of Solar Flares held at the Goddard Space Flight Center, Greenbelt, Md., 28-30 Oct 65, NASA-SP-50.

Descriptors: (*Solar flares, Electromagnetic properties), Astrophysics, Solar disturbances, Spectroscopy

Various aspects of solar flares such as dynamic phenomena, the relation to magnetic fields, electromagnetic radiations, particle emissions, and flare loops are discussed with attempts at classification in terms of observable effects. Discrepancies in defining the mechanisms that must exist stress the need for further observations. (Author)

AD-625 933 Fld. 3/2
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
ROTATION AND GRAVITATIONAL COLLAPSE,
by R. V. Wagoner. 1 Feb 65, 6p. Contract AF49(638)-1389
AFOSR 65-1831
Unclassified report

Availability: Published in The Physical Review v138 n6B pB1583-8 Jun 21 1965. Copies to DDC users only.

Descriptors: (*Gravity, Rotation), (*Rotation, Stars), Relativity theory, Mass transfer, Density, Field theory, Spheres

A new method of solution of the Einstein field equations is used to investigate the gravitational collapse of a rotating massive body. The equations are studied on a timelike hyperplane of reflection symmetry within an axially symmetric distribution of perfect fluid. The assumptions of negligible pressure and uniform angular velocity in the hyperplane, as well as certain restrictions on the development of the metric off the hyperplane, allow the metric to be reduced to a simple form. An explicit family of solutions is obtained for the evolution in time of the metric at a fixed radius in a comoving coordinate system. These solutions contain as limiting cases, valid throughout the hyperplane, the nonrotating collapse of a uniform-density sphere and the Newtonian equation of motion for a class of finite rotating bodies. The general solution reveals that rotation is unable to halt gravitational collapse at a given comoving radius if the ratio of rest mass 'interior' to that radius to angular momentum per unit mass at that radius is sufficiently large. In that case the contribution of the rotational kinetic energy to the effective gravitational mass becomes more improtant than the opposing effect of centrifugal force. This leads to a dynamical singularity, in which the proper-time derivatives of both radial and circumferential distances become negatively infinite, while the distances themselves remain finite. (Author)

AD-625 980 Fld. 3/2
ARECIBO IONOSPHERIC OBSERVATORY PUERTO RICO
PLANETARY RADAR ASTRONOMY,
by Gordon Pettengill. 1965, 12p. Contract AF49(638)-1156 ,ARPA Order 270-62
AFOSR 65-1765
Unclassified report

Lectures presented at the NATO Advanced Study Institute of the National Observatory of Athens: Cape Sounion 2-15 Aug 1964.

Availability: Published in Solar System Radio Astronomy chap18 p401-11 1965. Copies to DDC users only.

Descriptors: (*Radio astronomy, Planets), (*Planets, Radio astronomy), Radar signals, Radar reflections, Extraterrestrial topography, Surface properties, Celestial mechanics

A review is presented of the development of radar astronomy and its application to the study of planetary orbits, surfaces, and rotations. Its most important result is an improved value for the astronomical unit of 149, 598, 000 = 500 km. From the strength of the returned echoes it is possible to exclude the presence of substantial amounts of liquid water on Mercury, Venus, and Mars. Venus appears to have the densest surface, approximately the same as for solid terrestrial rocks. Mercury appears to reflect in most respects like the moon, but Mars has a surface reflectivity which is highly variable and appears to be correlated with surface position. The surface slopes of Venus appear to be less steep than in the case of the moon, while for Mars they are smoother yet. In the case of Venus, rotation has very reliably been established to be 247 = 5 days retrograde sidereal with an axis oriented very nearly perpendicular to the orbital plane of the planet. (Author)

AD-625 991 Fld. 3/2
STANFORD UNIV CALIF RADIO ASTRONOMY INST
THE STANFORD COMPOUND-GRATING INTERFEROMETER,
by J. S. Picken, and G. Swarup. 14 Mar 64, 6p. Contract AF49(638)-1059
AFOSR 65-2257
Unclassified report

Availability: Published in Astronomical Journal v69 n5 p353-6 Jun 1964. Copies to DDC users only.

Descriptors: (*Interferometers, Radio astronomy), Antenna arrays, Parabolic antennas, Polarization, S band, Beams (Electromagnetic), Scanning

A compound interferometer of high angular resolving power in one coordinate has been constructed at Stanford using the E-W arm of the existing cross antenna. The instrument produces multiple fan beans 52 minutes E-W by 2.3 degrees N-S at 9.1-cm wavelength. It is capable of observing the size and percentage of circular polarization of solar radio plages, the solar disk, and galactic and extragalactic radio sources. (Author)

AD-626 092 Fld. 3/2
UNIVERSITY COLL DUBLIN (EIRE)
ASTRONOMICAL OBSERVATIONS FROM SPACE VEHICLES: UPPER LIMITS TO THE FLUX OF HIGH ENERGY GAMMA-RAYS FROM SELECTED QUASISTELLAR AND OTHER SOURCES, USING THE CERENKOV TECHNIQUE,
by C. D. Long, N. A. Porter, T. C. Weekes, J. F. Fruin, and J. V. Jelley. 17 Sep 64, 5p. Contract AF-EOAR-80-63
AFOSR 65-1840
Unclassified report

Availability: Published in Extrait des Annales d'Astrophysique v28 n1 p263-4 Jan-Feb 1965. Copies to DDC users only.

Descriptors: (*Cosmic rays, Gamma rays), (*Gamma rays, Sources), Cerenkov radiation, Galaxies, Nebulae, Stars, Gamma emission

Upper flux limits at the earth for gamma rays of energy greater than about 5 X 10 to the 12rh power e.v., have been established for the quasi-stellar sources 3C 147, 3C 196, 3C 273, the Crab Nebula, and the magnetic variable 53 Cam. They are all of the order 10 to the -10th power photons/cm sq.s. Corresponding upper energy limits at emission are of the order 5 X 10 to the 47th power ergs/s for the quasi-stellar sources, and 5 X 10 to the 35th power ergs/s for the Crab Nebula, if gamma-ray absorption is assumed negligible. Possible absorption mechanisms are discussed. (Author)

AD-626 105 Fld. 3/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
TEMPERATURES OF METEOROIDS IN SPACE,
by C. P. Butler. 4 Nov 65, 27p. Rept. no. USNRDL-TR-927
Unclassified report

Descriptors: (*Meteors, Temperature), Meteorites, Solar radiation, Absorption, Thermal properties, Optical analysis

On the basis of reported optical measurements of iron and stony meteorites, upper and lower limits for solar absorptance and hemispherical emittance of such surfaces have been tentatively established. Temperatures of three classes of meteoroids, none larger than 10 meters in radius have been calculated for various orbits and alpha/epsilon ratios. These classes are light chondrites, dark chondrites, and the irons. Temperatures for a meteoroid in a Mercury orbit range from 100C for a light chondrite to 400C for an iron. (Author)

AD-626 111 Fld. 3/2
KELLOGG RADIATION LAB CALIF INST OF TECH PASADENA
STELLAR EVOLUTION AND AGE DETERMINATIONS, CHAPTER XI,
by R. L. Sears, and Robert R. Brownlee. 1964, 66p.
Unclassified report

Prepared in cooperation with California Univ., Los Angeles. Dept. of Astronomy.

Availability: Published in Stars and Stellar Systems, v8 p575-641 1965. Copies to DDC users only.

Descriptors: (*Stars, Geologic age determination), Phase studies, Astrophysics, Spectroscopy

AD-626 165 Fld. 3/2, 7/4
CFSTI Prices: HC $1.00 MF $0.50
HARVARD COLL OBSERVATORY CAMBRIDGE MASS
CALCULATIONS OF IONIZATION EQUILIBRIA FOR OXYGEN,
by John W. Allen. Nov 65, 24p. Rept. no. Scientific-7
Contract Nonr-1866(48) ,NsG-438
Unclassified report

Descriptors: (*Oxygen, Gas ionization), (*Gas ionization, Chemical equilibrium), (*Recombination reactions, Chemical equilibrium), (*Solar corona, Gas ionization), Reaction kinetics, Atomic energy levels, Excitation, Electron transitions

Calculations of ionization equilibria are collisional ionization, radiative recombination, and dielectronic recombination. The effects of including dielectronic recombination in the calculations are discussed. (Author)

AD-626 221 Fld. 3/2
CFSTI Prices: HC $2.00 MF $0.50
UNIVERSITY COLL LONDON (ENGLAND)
THE COLLAPSE OF INTERSTELLAR GAS CLOUDS.
Annual summary rept. 1964-65,
by D. McNally. Nov 65, 26p. Contract N62558-4281 Proj. NR-046-808
Unclassified report

Descriptors: (*Interstellar matter, Gas flow), (*Gas flow, Interstellar matter), Stars, Gases, Equations of state, Celestial mechanics, Astrophysics

The report sets out the work done in three categories on star formation: (1) the numerical methods developed for following the evolution of collapsing gas clouds, (2) the development of initial Eata permitting the study of gas clouds with a wide range of initial density distributions, (3) the preliminary results obtained while developing (1) above. It is proposed to develop these studies further and to produce a catalogue of interstellar spectral features. (Author)

AD-626 452 Fld. 3/2, 20/13
CALIFORNIA INST OF TECH PASADENA
AN OBSERVATIONAL TEST OF THEORIES OF NEUTRON-STAR COOLING,
by John N. Bahcall, and Richard A. Wolf. 8 Apr 65, 4p. Contract Nonr-220 (47) Grant ,NASA-NGR-05-002-028
Unclassified report

Availability: Published in The Astrophysical Journal, v142 n3 p1254-6 1 Oct 1965. Copies to DDC users only.

Descriptors: (*Stars, Cooling), Thermal radiation, Neutrinos, Photons, Radiation (Heat transfer), Astrophysics, Nuclear reactions

The purpose of this Note is to point out that theories describing the cooling of neutron stars are subject to an observational test should a neutron star ever be detected. The basic idea of the proposed test is that the photon luminosity of a neutron star should decrease more rapidly if neutrino-energy losses are present than if the only cooling mechanism were photon emission. In particular, a measurement of the time derivative of the logarithm of the photon flux, should be sufficient to determine whether or not the rate of cooling by neutrino emission is, as predicted for most neutron-star temperatures that are observationally accessible, large compared to the rate of photon emission.

AD-626 453 Fld. 3/2
CALIFORNIA INST OF TECH PASADENA
MAGNETOTURBULENT ENERGY AND STABILITY OF SUPERMASSIVE STARS,
by S. P. S. Anand. 1965, 6p. Contract Nonr-220 (47) Grant ,NASA-NGR-05-002-028
Unclassified report

Availability: Published in Nature, v207 n5004 p1345-6 25 Sep 1965. Copies to DDC users only.

Descriptors: (*Stars, Magnetohydrodynamics), Kinetic energy, Relativity theory, Field theory, Mass-energy relation, Stabilization, Astrophysics

Fowler's binding energy method is used to show that the turbulent kinetic energy associated with the internal magnetic disturbances (with conservation of magnetic flux) is also an effective physical mechanism to remove the general relativistic instability.

AD-626 459 Fld. 3/2
CALIFORNIA INST OF TECH PASADENA
THE SYNTHESIS AND DESTRUCTION OF ELEMENTS IN PECULIAR STARS OF TYPES A AND B,
by William A. Fowler, E. Margaret Burbidge, G. R. Burbidge, and Fred Hoyle. 15 Feb 65, 29p. Contract Nonr-220 (47) Grant ,NsG-357
Unclassified report

Availability: Published in The Astrophysical Journal v142 n2 p423-50 15 Aug 1965. Copies to DDC users only.

Descriptors: (*Stars, Nuclear reactions), Chemical analysis, Synthesis (Chemistry), Astrophysics

A discussion is given of the properties of the peculiar A and B stars and especially their anomalous abundances and positions in the H-R diagram. It is known that the compositions can only be explained if it is supposed that (i) the high abundances of heavy elements, particularly in the rare-earth region, and the abundances in the vicinity of the iron peak have been produced in a region in which a process of rapid neutron addition has occurred; it is shown here that the conditions are suitable for this when the star has reached a degenerate core configuration, the key reaction being C (13) (alpha, n). This implies that either the peculiar A and B stars are at an advanced phase of evolution, i.e., they have passed through a giant phase and have returned to the vicinity of the unevolved main sequence, or else that such a process has gone on in a close binary companion and mass has been transferred to the surface of the peculiar star. This latter possibility is open to observational test since, if this were true, all stars of this type should have close evolved companions. In addition to an gamma-process of this type, it is also shown (ii) that to produce the underabundance of the light elements, especially helium, and also to obtain the high He (3):He (4) ratio seen in 3 Centauri A a vast amount of surface spallation followed by shallow mixing must have occurred. The stars have therefore had a very complicated evolutionary history, with surface spallation and then interior nucleosynthesis followed by rapid mixing. (Author)

AD-626 461 Fld. 3/2, 20/8
CALIFORNIA INST OF TECH PASADENA
RATES OF NUCLEAR REACTIONS IN SOLID-LIKE STARS,
by Richard A. Wolf. 9 Nov 64, 10p. Contract Nonr-220 (47) Grant ,NGR-05-002-028
Unclassified report

Availability: Published in Physical Review v137 n6B pB1634-43 Mar 22 1965. Copies to DDC users only.

Descriptors: (*Stars, Nuclear reactions), Nuclei, Kinetic energy, Reaction kinetics, Wave functions, Astrophysics

In stellar matter as cool and dense as the interior of a white dwarf, the Coulomb energies between neighboring nuclei are large compared to the kinetic energies of the nuclei. Each nucleus is constrained to vibrate about an equilibrium position, and the motion of the nuclei in the interior of a white dwarf is similar to the motion of the atoms in a solid or liquid. We propose a solid-state method for calculating the rate at which a nuclear reaction proceeds between two identical nuclei oscillating about adjacent lattice sites. An effective potential U (r) derived by analyzing small lattice vibrations is used to represent the influence of the Coulomb fields of the lattice on the motion of the two reacting nuclei. The wave function describing the relative motion of the two reacting particles is obtained by solving the Schrodinger equation containing the effective potential U (r). From this wave function, we derive an expression for the reaction rate. The rates of the p+p and C (12)+C (12) reactions calculated using this solid-state method are typically 1 to 10 orders of magnitude smaller than those calculated by the method previously suggested by Cameron. (Author)

AD-626 564 Fld. 3/2, 20/8
MONTANA STATE COLL BOZEMAN
THE FAST CN CYCLE,
by Georgeanne R. Caughlan, and William A. Fowler. 1965, 1p. Contract Nonr-220 (47) Grant, NsG-430
Unclassified report

Presented at the Meeting of the American Astonomical Society (119th), Michigan Univ., Ann Arbor, 3-6 Aug 65.

Availability: Published in Unidentified journal v70 n9 p1334 Nov 1965. Published by the American Inst. of Physics for the American Astronomical Society. Copies to DDC users only.

Descriptors: (*Stars, Thermonuclear reactions), (*Thermonuclear reactions, Stars), Astrophysics, Proton capture, Carbon, Nitrogen

AD-626 163 **See Fld. 7/4**

AD-626 164 **See Fld. 7/4**

AD-626 167 **See Fld. 4/1**

AD-626 205 **See Fld. 4/1**

AD-626 457 **See Fld. 20/8**

4/1. ATMOSPHERIC PHYSICS

AD-625 679 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
A STUDY OF THE RELATIONSHIP BETWEEN ABSORPTION-TIME PROFILES OF POLAR-CAPABSORPTION EVENTS AND FORBUSH DECREASES OF COSMIC-RAY INTENSITY.
Revised ed.,
by John T. Gosling. 17 Dec 63, 8p. Contract AF-AFOSR-62-422 Proj. AF-9774 Task 977402
AFOSR 65-1751
Unclassified report

Revision of manuscript submitted 28 Oct 63.

Availability: Published in Journal of Geophysical Research v69 n7 p1233-8 Apr 1 1964. Copies to DDC users only.

Descriptors: (*Cosmic rays, Solar wind), (*Solar wind, Cosmic rays), Sun, Space environmental conditions, Magnetic fields, Absorption, Neutron counters

Forbush decrease data recorded by neutron monitors during Polar-Cap-Absorption events support the interpretation of the absorption-time profiles of PCA events as due to solar particles under the influence of magnetic fields carried by solar plasma. All PCA events showing evidence of strong trapping of solar particles are accompanied by strong Forbush decreases, the magnitudes of which are a function of the delay time from flare to SC storm. Those PCA events showing little evidence of trapping are accompanied by only very weak decreases. The large western excess of these latter events is explained in terms of sun-earth magnetic linkage set up by earlier flare activity. The relative merits of two models of the interplanetary fields are examined. (Author)

AD-625 701 Fld. 4/1, 20/8
LUND UNIV (SWEDEN) DEPT OF PHYSICS
FLUX AND ENERGY SPECTRUM OF LOW-ENERGY COSMIC RAY PROTONS,
by K. Kristiansson. 1965, 12p. Contract AF-EOAR-35-64 Proj. AF-9751 ,AF-9774 Task 975104 ,977402
AFOSR 65-1845
Unclassified report

Availability: Published in Arkiv for Fysik v29 n3 p23-32 1965. Copies to DDC users only.

Descriptors: (*Cosmic rays, Energy), (*Protons, Cosmic rays), Particle spectra, Solar flares, Solar radiation, Sweden

A spectrum of protons in the energy interval 25-150 Mev is studied in a nuclear emulsion block which was exposed in a Nike-Cajun rocket launched from Kronogard in northern Sweden. The exposure was made at a time of low solar activity. The integral momentum spectrum of the protons can approximately be expressed by the formula J = K exp (-p/q) where K=11,000 protons/m-sq sec. and sterad and q =75 MV. The spectrum is discussed and compared with solar flare proton pectra. (Author)

AD-625 702 Fld. 4/1, 20/8
LUND UNIV (SWEDEN) DEPT OF PHYSICS
THE RELATIVE ABUNDANCE OF NUCLEI HEAVIER THAN HELIUM IN PRIMARY COSMIC RADIATION NEAR THE GEOMAGNETIC EQUATOR,
by O. Mathiesen, and A. Stenman. 1965, 23p.
Contract AF-EOAR-35-64 Proj. AF-9751 ,AF-9774 Task 975104 ,977402
AFOSR 65-1844

Unclassified report

Availability: Published in Arkiv For Fysik v29 n11 p145-65 1965. Copies to DDC users only.

Descriptors: (*Cosmic rays, Nuclei), (*Nuclei, Abundance), Terrestrial magnetism, Upper atmosphere, Spallation, Ionization trails, Photometers, Carbon, Nitrogen, Oxygen

Photometric measurements were made on 89 tracks of heavy primary particles (Z > 2), which were found in an emulsion stack exposed at Guam near the geomagnetic equator. The measurements were corrected for different emulsion effects. The standard error in the charge determination was found to be about 0.25 units of charge. The charge calibration was made by measurements of delta-ray and blob densities and by studying suitable break-up events. The observed spectrum was divided into three groups: L (3 or = Z or = 5), M (6 or = Z or = 9), and H (Z or = 10). These were extrapolated to the top of the atmosphere. The following deductions were made: (1) The ratio A of the abundance of particles of type L to that of M = 0.05 = 0.08. A comparison of this value with determinations of the ratio at other latitudes suggests that the energy spectrum of L nuclei may possibly be steeper than that of M nuclei. Some of the hypotheses proposed to explain the energy dependence of A are discussed. Of these, the three-dimensional diffusion model of particle propagation is found to be capable of accounting for the observed energy dependence, assuming that 'soft' magnetic clouds are responsible for the diffusion mechanism. (2) The amounts of C and N nuclei relative to O nuclei at the top of the atmosphere are 1.4 + 0.4 and 0.3 = 0.1 respectively. (Author)

AD-625 754 Fld. 4/1
FLORIDA STATE UNIV TALLAHASSEE
VELOCITY DIVERGENCE DURING THE 1957 STRATOSPHERIC WARMING,
by Richard A. Craig. 2 Nov 64, 12p. Contract AF19 (604)-5471 ,AF19 (628)-394

Unclassified report

Availability: Published in Journal of Geophysical Research v70 n12 p2769-80 Jun 15 1965. Copies to DDC users only.

Descriptors: (*Stratosphere, Thermodynamics), (*Atmospheric temperature, Stratosphere), Meteorology, Kinetic energy

Divergence has been computed, from the adiabatic form of the energy equation, for (a) each of 56 locations on a grid covering most of the United States and Canada; (b) each of the 100-mb and 50-mb levels; (c) each twicedaily observing time during the period January 17 to February 14, 1957. The root-mean-square value of divergence, computed for each map, was usually between 2 and 3 x 0.000001/sec at both 100 mb and 50 mb. For most map times and levels, but with important exceptions, the correlation of horizontal convergence and downward motion was positive. A large center of horizontal divergence was apparent in the analyzed area several days before evidence of stratospheric warming was pronounced (about February 4); this was replaced during the time of rapid development of the warming by a large center of horizontal convergence. In general, there was no significant correlatioiioon between total divergence of the geostrophic wind. (Author)

AD-625 814 Fld. 4/1, 8/14
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
PHENOMENA IN THE UPPER ATMOSPHERE,
by Edward Gelins. 7 Dec 65, 79p. Rept. no. ATD-65-81
TT 66-60152

Unclassified report

Report on Surveys of Communist World Scientific and Technical Literature.

Descriptors: (*Upper atmosphere, Atmospheric sounding), (*Atmospheric sounding, Upper atmosphere), Ionosphere, Electromagnetic waves, Propagation, Cosmic rays, Atmospherics, Terrestrial magnetism, Aurorae

Contents: The ionosphere and electromagnetic wave propagation; Cosmic radiation and the radiation belts; Telluric currents, Geomagnetism, and whistlers; Satellite and missile electromagnetic wave propagation; Auroras and electromagnetic wave propagation.

AD-625 887 Fld. 4/1, 20/4, 7/4
CFSTI Prices: HC $1.00 MF $0.50
HELIODYNE CORP LOS ANGELES CALIF
RE-ENTRY PHYSICS RESEARCH.
Semi-annual technical summary rept. 13 Jun-12 Dec 65.
Dec 65, 13p. Contract DA-01-021-AMC-12727 (Z)

Unclassified report

Descriptors: (*Reentry vehicles, Wake), (*Atmosphere entry, Scientific research), Gas flow, Chemical reactions, Shock waves, Turbulence, Spectroscopy, Optical properties, Deflection, Halocarbon plastics, Argon, Nitrogen, Air, Abstracts

Investigations were conducted in the areas of mixing and chemical reactions in turbulent wakes; analyses of optical deflections through a turbulent wake; shock structure in a non-reacting, ablating dust-laden gas; and shock tube studies of the optical and chemical properties of teflon in argon, nitrogen and air. The individual research topics are described in the following pages in the form of abstracts from completed reports, or progress reports on continuing activities. (Author)

AD-625 960 Fld. 4/1, 22/2, 20/8
CFSTI Prices: HC $4.00 MF $1.00
AMERICAN SCIENCE AND ENGINEERING INC CAMBRIDGE MASS
THE ENERGETIC CHARGED PARTICLE ENVIRONMENT OF THE EARTH (HITCH-HIKER I DATA ANALYSIS).
Final rept. 15 May 64-14 Aug 65,
by Frank R. Paolini, George C. Theodoridis, and Michael Bate. 13 Sep 65, 150p. Rept. no. ASE-1056
Contract AF19 (628)-4207 Proj. AF-0000 Task 000024
AFCRL 65-692

Unclassified report

Descriptors: (*Van Allen radiation belt, Space probes), (*Space probes, Van Allen radiation belt), (*Scientific satellites, Radiation measurement systems), Ionosphere, Space environmental conditions, Charged particles, Distribution, Graphics

The results of the reduction and analysis of data obtained from instrumentation flown on the Air Force Satellite Hitch-hiker I (1963-25B) are presented. The instrumentation included two electrostatic analyzers (one for electrons, 15 to 100 kev, the other for protons, 15 to 100 kev); a scintillation spectrometer (for electrons, 0.7 to 4.0 Mev); a phoswich scintillation spectrometer (for protons 1. to 5. Mev and 7.5 to 120 Mev); and a Geiger counter (electrons greater than 4. Mev, protons greater than 40. Mev). Detailed data on integral energy spectra, pitch angle distributions, and perpendicular unidirectional intensities, as functions of B, L (or lambda, L) and time are given in five papers appended to this report. No substantial intensities of protons, 15 to 100 kev, were observed. Electrons, 15 to 100 kev, were observed with intensities as great as 2 x 100lll/sq cm-sec-ster-kev at 40 kev, but the anomalous angular distributions obtained cast doubt on the credibility of these data. Peak inner belt intensities for electrons above 1 Mev were about 5 x 100,000 electrons/sq cm sec ster at L approx. 1.6.

AD-625 973 Fld. 4/1
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS METEOROLOGY LAB
THE PERSISTENCE AND VARIABILITY OF ANOMALOUS E-REGION PENETRATING FREQUENCIES.
Environmental research papers,
by Norman J. MacDonald. 26 Feb 65, 21p.
Rept. no. ERP-144
Proj. AF-8604 Task 860404
AFCRL 65-738

Unclassified report

Availability: Published in Journal of Atmospheric and Terrestrial Physics v27 p1009-18 1965. Copies to DDC users only.

Descriptors: (*Atmospheric sounding, Radio waves), (*Ionosphere, Diurnal variations), Electromagnetic wave reflections, Statistical analysis

Statistical analyses of the highest returned frequency from the E-region during daylight and night-time hours at Washington, D.C. are described. The results show an annual change in the character of the diurnal variation of this parameter. During the winter the daytime maximum occurs around noontime and then shifts to the midmorning hours by the late summer months. Except for the annual variation, variance spectrum analyses show no significant tendency toward periodicities longer than two days in the noontime observations of f sub o E sub max. However, the spectrum of the midnight observations shows, in addition to the annual period, evidence of a significant peak at six months, and another close to the lunar synodical period of approximately 29.5 days. (Author)

AD-626 071 Fld. 4/1, 8/14
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
TWO TYPES OF IONOSPHERIC STORMS,
by A. S. Besprozvannaya. Dec 65, 19p. Rept. no. FSTC-381-T5-550
TT 66-60190

Unclassified report

Trans. of Problemy Arktiki i Antarktiki (USSR) n13 p67-78 1963.

Descriptors: (*Ionospheric disturbances, Magnetic storms), Terrestrial magnetism, Geophysics, USSR

Phenomena observed in the ionosphere at the time of magnetic disturbances are discussed. On the basis of the material on ionospheric observations collected over a period of ten years (1946-1955)

in the Tiksi bay, located near the zone of maximum auroral frequency, it is demonstrated that the relationship between the disturbances in the upper layers of the ionosphere (lowering of f sub o F2), and those in the lower layers (anomalous absorption) vary substantially from storm to storm. It was possible to isolate two types of storms: F-type storms, for which no noticeable increase of anomalous absorption is observed in the auroral zone in the presence of strong disturbances in the F2 layer, and the FD-type storms, in which a substantial increase of anomalous absorption was observed simultaneously with a decrease in f sub o F2.

AD-626 096 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
OBSERVATIONS OF LONG-PERIOD PULSATIONS OF ELECTRON PRECIPITATION IN CONJUGATE REGIONS OF THE AURORAL ZONES,
by R. R. Brown, J. R. Barcus, J. Reid, and N. R. Parsons. 4 Dec 64, 6p. Contract AF-AFOSR-331-63 Proj. 9774 Task 977402
AFOSR 65-1877

Unclassified report

Prepared in cooperation with Department of External Affairs, Melbourne (Australia). Antarctic Div.

Availability: Published in Journal of Geophysical Research v70 n5 p1246-9 Mar 1 1965. Copies to DDC users only.

Descriptors: (*Atmospheric sounding, Polar regions), (*Electron density, Atmospheric sounding), Aurorae, X rays, Cosmic rays, Geophysics, Atmosphere, Gas ionization

Observations are summarized for a long-period pulsation event in ionospheric absorption of cosmic radio noise at Kotzebue, Alaska and at the Australian National Antarctic Research Expeditions' Station at Macquarie Island. Although there is a great degree of simultaneity and similarity, additional features of pulsating electron precipitation are shown from X-ray and riometer observations. These observations outside the immediate vicinity of the conjugate regions indicate spatial structure on a scale of a few hundred km. (Author)

AD-626 097 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
EVIDENCE SUGGESTING DUMPING OF SEMI-TRAPPED ELECTRONS ON THE NIGHT SIDE OF THE EARTH,
by J. R. Barcus. 30 Sep 64, 5p. Contract AF-AFOSR-62-422 ,AF-AFOSR-331-63 Proj. AF-9774 Task 9774-02
AFOSR 65-1878

Unclassified report

Availability: Published in Journal of Geophysical Research v70 n5 p1237-9 Mar 1 1965. Copies to DDC users only.

Descriptors: (*Electron density, Atmospheric sounding), (*Atmospheric sounding, Electron density), Aurorae, Cosmic rays, Gas ionization, Geophysics, Space environmental conditions, Polar regions, Atmosphere

A precipitation event intense enough to make a near maximum demand on the outer zone was observed by means of bremsstrahlung x-rays with a balloon-borne scintillation detector. The balloon was launched from Barrow, Alaska, in March, 1963 during the recovery phase of a magnetic storm. X-ray activity above 100 kev was barely detectable, except for an extremely intense burst (350 times normal) occurring at approximately 1030 UT. The origin of this striking spectral variation is considered. It is pointed out that local acceleration, other than untrapping mechanisms, need not necessarily coincide with the region of precipitation. It is possible that daytime events, extensive in space and time, are the result of energization processes occurring in the sunlit magnetosphere; the transient and localized bursts occurring near midnight are the result of partial dumping of the semitrapped enhancement in the outer zone. (Author)

AD-626 098 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
BALLOON OBSERVATIONS OF AURORAL ZONE X-RAYS IN CONJUGATE REGIONS. I. SLOW TIME VARIATIONS,
by R. R. Brown, J. R. Barcus, and N. Parsons. 11 Feb 65, 22p. Contract AF-AFOSR-331-63 Proj. 9774 Task 977402
AFOSR 65-1881

Unclassified report

Prepared in cooperation with Department of External Affairs, Melbourne (Australia), Antarctic Div.

Availability: Published in Journal of Geophysical Research v70 n11 p2579-98 Jun 1 1965. Copies to DDC users only.

Descriptors: (*Atmospheric sounding, Polar regions), (*Electron density, Atmospheric sounding), (*X-rays, Cosmic rays), Aurorae, Gas ionization, Geophysics, Atmosphere

Conjugate aspects of auroral zone electron precipitation are examined using data from ten simultaneous balloon flights of X-ray detectors from Fairbanks, Alaska, and Macquarie Island, Australia, as well as riometer data from Kotzebue and College, Alaska. These results indicate a close correspondence, in similarity and simultaneity, in regions of near conjugacy over a wide range (K sub p = 0 + to 6 sub 0) of geophysical disturbance. Whereas gross features of activity remain intact, dissimilarities become quite evident at locations well removed from near conjugacy. (Author)

AD-626 099 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
BALLOON OBSERVATIONS OF AURORAL ZONE X-RAYS IN CONJUGATE REGIONS. 2. MICROBURSTS AND PULSATIONS,
by R. R. Brown, J. R. Barcus, and N. R. Parsons. 1 Feb 65, 16p. Contract AF-AFOSR-331-63 Proj. 9774 Task 977402
AFOSR 65-1882

Unclassified report

Prepared in cooperation with Department of External Affairs, Melbourne (Australia) Antarctic Div.

Availability: Published in Journal of Geophysical Research v70 n11 p2599-2612 Jun 1 1965. Copies to DDC users only.

Descriptors: (*Atmospheric sounding, Polar regions), (*X rays, Cosmic rays), Aurorae, Gas ionization, Geophysics, Atmosphere

Simultaneous balloon observations of X-ray pulsations in the 5-10 second range made from Fairbanks, Alaska, and Macquarie Island, Australia, showed no detailed correlation in time or amplitude. Observations in the northern hemisphere, with two balloon instruments separated by about 150 km in the east-west direction, showed no obvious correlation, but when the separation was reduced to about 100 km in the north-south direction, X-ray pulsations showed in-phase variations. Observations with two balloon instruments separated by 150 km in the east-west direction showed time coincidences for about one-third of the microbursts; the other two-thirds were observed on one balloon or the other. From the small scale size of microburst electron precipitation it is suggested that magnetospheric plasma instabilities are responsible for the electron bombardment of the auroral zone atmosphere. Similar considerations are suggested for pulsating electron precipitation. (Author)

AD-626 167 Fld. 4/1, 3/2, 8/14
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB
UPPER ATMOSPHERE PHENOMENA ASSOCIATED WITH THE 2+SOLAR FLARE OF OCTOBER 22, 1963.
Environmental research papers,
by William C. Kidd. Oct 65, 31p. Rept. no. ERP-152
Proj. AF-4643 Task 464302
AFCRL 65-762

Unclassified report

Descriptors: (*Solar flares, Magnetic storms), (*Magnetic storms, Solar flares), (*Upper atmosphere, Magnetic storms), Atmospheric sounding, Radar pulses, Backscattering, Extraterrestrial radio waves, Scintillation, Riometers, Magnetometers

The changes triggered by a solar flare in a number of atmospheric phenomena have been studied at one location. The x-ray-induced events such as sudden ionospheric absorption occurring immediately after the flare were of relatively short duration, that is, one to two hours, and show the familiar course of events. However, the corpuscular-induced ionospheric events such as auroral absorption and scintillation which follow the flare by approximately a day and a half are of interest in their latitude variation. Some observations, such as 19-Mc/sec radar backscatter and ionosoundings, show no time lag with reference to the commencement of the geomagnetic storm. The riometers show that the absorption phenomena commence first in the north and move in time to the south. The radiostar and scintillation observations show the same motion in time, that is, away from the auroral zone with the 200-400 km irregularities which produce scintillations showing a lower latitude boundary during the storm than before commencement. (Author)

AD-626 194 Fld. 4/1
CFSTI Prices: HC $1.00 MF $0.50
IONOSPHAREN-INSTITUT BREISACH (GERMANY)
CRITICAL DISCUSSION OF SOME REGION DRIFT DATA.
Annual summary rept. for 1964-65,
by E. Harnischmacher. 15 Jul 65, 21p. Rept. no. IIB-13a
Contract AF61 (052)-672
AFCRL 65-821

Unclassified report

Descriptors: (*Ionosphere, Electron density), (*Atmospheric sounding, Electron density), Drift, Electromagnetic wave reflections, Recording systems

Detailed investigation of reductions published in IIB No. 13 (AD-614 670) indicates that some confusion exists concerning the relation of the recorded traces with the antennae. A special test method is described. (Author)

AD-626 198 Fld. 4/1, 20/6
CFSTI Prices: HC $3.00 MF $0.75
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
STUDY OF LIGHT ATTENUATION UNDER SUBTROPICAL CLIMATIC CONDITIONS.
Rept. no. 1, 1 Jul 63-30 Nov 65,
by H. W. Hiser, P. E. Norman, and J. D. Hirth. Dec 65, 97p. Rept. no. 8209-1 ML-65357
Contract DA-36-039-AMC-0352E Proj. DA-3A99-27-005

Unclassified report

Descriptors: (*Light transmission, Atmosphere), Light, Attenuation, Optics, Tropical regions, Florida, Optical equipment

This report contains an analyzed sample of attenuation measurements of blue, green, red and infrared light made in the Florida Everglades in the summer quarter of 1964. Data for the other three seasons will be included in the final report. Graphs are presented for: total transmittance versus range, direct transmittance versus range, and the ratio of indirect to direct light intensity versus the direct extinction coefficient times range. A portion of the report describes the field site, equipment used, and methods of data collection. Several auxiliary graphs give results of Polar Nepholometer measurements of the light scattered from particles in a small volume of air as a function of the angle of incidence and reflection. (Author)

AD-626 199 Fld. 4/1, 20/14, 22/2
CFSTI Prices: HC $2.00 MF $0.50
NATIONAL OBSERVATORY OF ATHENS (GREECE) IONOSPHERIC INST
STUDIES OF THE IONOSPHERE USING TRANSMISSIONS FROM ACTIVE SATELLITES.
Annual rept. 1 Jan 64-28 Feb 65,
by Michael Anastassiadis. 28 Feb 65, 26p. Contract AF61 (052)-754
AFCRL 65-626

Unclassified report

Descriptors: (*Atmospheric sounding, Radio transmission), (*Radio transmission, Atmospheric sounding), (*Communication satellites (Active), Atmospheric sounding), (*Ionosphere, Atmospheric sounding), Electron density, Scintillation, Magnetic storms, Solar disturbances, Geophysics

During the past year and the above considered period, Athens center, recorded a large number of transmissions from active satellite, in order to investigate the ionosphere. Amplitude recordings were obtained following a common program established for JSSG Laboratories. Results from others special programs prepared by Athens center, in order to investigate definite problems of the upper atmosphere, are also reported. (Author)

AD-626 203 Fld. 4/1, 20/14
CFSTI Prices: HC $2.00 MF $0.50
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
ELECTRON BALLISTICS AND ELECTROMAGNETIC WAVES IN THE IONOSPHERE.
Technical rept.,
by J. G. Chaney. 10 Nov 65, 45p. Rept. no. TR-56

Unclassified report

Descriptors: (*Ionosphere, Electromagnetic properties), (*Electromagnetic waves, Ionospheric propagation), (*Ionospheric propagation, Electromagnetic waves), Electrons, Trajectories, Plasma physics, Magneto-optic effect, Geodesics

It is shown that ion collisions introduce a slight reduction in the plasma frequency, along with an exponential decay of transient electron oscillations. The critical frequencies for penetration of a homogeneous ionosphere, for both isotropic and anisotropic ionospheres, are determined. The characteristic waves, for electromagnetic propagation within a homogeneous anisotropic ionosphere, are developed by considering an infinite series of electron velocities, produced by Ampere's force law, reacting with the electron oscillation produced by an exciting electric field. The complex indices of refraction are determined, both from a dispersion equation and from a derivation of the Appleton equation, which uses an arbitrary selection of the coordinate axes, thus emphasizing the invariance of the Appleton equation. Vector and tensor algebra is used throughout the analytical developments. (Author)

AD-626 205 Fld. 4/1, 3/2, 20/8
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
MULTIPLE SCATTERING IN HOMOGENEOUS PLANE-PARALLEL ATMOSPHERES,
by T. W. Mullikin. Dec 65, 31p. Rept. no. RM-4846-PR
Contract AF49 (638)-1700

Unclassified report

Descriptors: (*Electromagnetic waves, Scattering), (*Atmosphere, Transport properties), Rayleigh scattering, Polarization, Absorption, Integral equations, Planetary atmospheres, Solar radiation, Neutron transport theory

Steady-state multiple-scattering problems for homogeneous plane-parallel atmospheres have been extensively studied by means of the principles of invariance of Ambartsumian and Chandrasekhar. These nonlinear integral equations have been used for computing intensities of radiation on the faces of the atmosphere. Using linear integral-equation theory, (it is shown how one computes the source function interior to an atmosphere with optical depth entering the computation only parametrically. Intensities, throughout the atmosphere, are expressed by nonlinear combinations of the computed source function, giving, on the faces, the familiar scattering and transmission functions. By a reduction developed by Sekera, this analysis is applied to Rayleigh scattering including the effects of polarization. (Author)

AD-626 228 Fld. 4/1, 20/6
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH AND ADVANCED DEVELOPMENT DIV AVCO CORP WILMINGTON MASS
MIE SCATTERING COEFFICIENTS FOR SELECTED AEROSOL SIZE DISTRIBUTIONS.
Final rept. 1 Apr 64-31 Oct 65,
by Rudolph Penndorf. 31 Oct 65, 21p. Rept. no. RAD-TR-65-39
Contract AF19 (628)-4072 Proj. AF-4479 Task 447919
AFCRL 65-836

Unclassified report

Descriptors: (*Aerosols, Refractive index), (*Atmospheric refraction, Light), (*Light, Atmospheric refraction), Particle size, Optics, Atmosphere

Formulas are derived for volume scattering coefficients applicable to aerosols. Different types of size distribution for the aerosol, such as normal distribution, log-normal distribution, and exponential distribution, are assumed. Nominal results obtained by the author and those published in the literature are given and discussed. The volume scattering coefficients become smooth functions. The size distribution is very wide. Hence, simpler mathematical formulation can be used than those obtained from the exact Mie theory. However, only the number of aerosol particles can be obtained from an evaluation of experimental data, but details of the size distribution cannot be extracted from experimental data. (Author)

AD-626 232 Fld. 4/1, 20/14
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
THE LOWEST IONOSPHERE, PART I,
by A. H. Waynick. 1965, 13p. Contract AF19 (122)-44

Unclassified report

Availability: Published in The Physics of the Ionosphere, Report of 1954 Cambridge Conference p1-13. Copies to DDC users only.

Descriptors: (*Ionosphere, Atmospheric sounding), (*Atmospheric sounding, Radio transmission), Probes, Radio waves, Ionospheric propagation, Electron density, Recombination reactions

An attempt is made to summarize the recent radio data which may be utilized as a guide to the possible physical characteristics of the lowest ionosphere. The consideration of anomalies and short period phenomena are purposefully avoided in an effort to deduce gross characteristics. The apparent current state of work concerned with four physical characteristics of the lowest ionosphere which are based in part on this evidence, and in part, on available, pertinent rocket data is briefly described. The factors considered are collision frequency, recombination, E-region electron density distribution, and D-region electron density distribution. (Author)

AD-626 233 Fld. 4/1, 20/14
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
M-TYPE IONOSPHERIC REFLECTIONS AT 150 KC/S,
by R. L. Schrag. 1965, 13p. Contract AF19 (122)-44 Grant ,NSF-G-450

Unclassified report

Availability: Published in The Physics of the Ionosphere, Report of 1954 Cambridge Conference p78-87. Copies to DDC users only.

Descriptors: (*Ionosphere, Electromagnetic wave reflections), (*Atmospheric sounding, Radio transmission), (*Radio transmission, Atmospheric sounding), Low frequency, Radio waves, Electromagnetic pulses, Polarization, Radio equipment

This paper is devoted to the description and interpretation of occasional observations of extraordinarily polarized echo 'trains' during vertically incident radio sounding experiments, using 150 kc/s pulsed signals. These echo 'trains', in addition to their unique polarizations, had low amplitudes, compared with the normal E-region echoes observed simultaneously, and exhibited unusually low successive-hop absorption. The phenomenon was detected in the course of night-time ionospheric recording employing extended-range receiving instrumentation (Schrag 1954). The experimental observations were found to be consistent with a highly efficient M-type reflection mechanism, utilizing X-mode reflectors at approximately 120 and 230 km. According to this interpretation, a rather deep ionization 'well' must have existed between regions E and F of the ionosphere. Information is also obtained concerning certain low-frequency properties of sporadic E and the state of polarization of received 150 kc/s signals which had pure X-mode polarizations above 100 km. (Author)

AD-626 234 Fld. 4/1, 20/14
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
A METHOD FOR STUDYING LARGE-SCALE IRREGULARITIES IN REGION E OF THE IONOSPHERE,
by R. L. Schrag. 1965, 12p. Contract AF19 (122)-44 Grant ,NSF-G-450

Unclassified report

Availability: Published in The Physics of the Ionosphere, Report of 1954 Cambridge Conference p202-11. Copies to DDC users only.

Descriptors: (*Atmospheric sounding, Radio transmission), (*Ionosphere, Electromagnetic wave reflections), (*Radio transmission, Atmospheric sounding), Ionospheric propagation, Radio waves, Multipath transmission, Optics

The present communication describes experimentally observed multiple-hop echo focusing phenomena due to E-region irregularities. These phenomena, detected principally during winter nighttime hours, were of a transient nature with lifetimes ranging from 6 to 50 minutes. An analysis, based on simple ray optics, indicates that the irregularities responsible for the focusing effects were 'large-scale', and had radii of curvature of the order of 1000 km. Estimates of the probable dimensions are presented. The experiments were conducted at vertical incidence, utilizing 150 kc/s pulsed radio signals. (Author)

AD-626 268 Fld. 4/1, 20/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL OBSERVATORY WASHINGTON D C
SUNLIGHT MOONLIGHT, AND TWILIGHT FOR ANTARCTICA 1966-1968,
by Louise B. Weston. 9 Apr 65, 10p. Rept. no. Circular-107
Unclassified report

Descriptors: (*Twilight, Antarctic regions), (*Sky brightness, Antarctic regions), Moon, Sun, Atmosphere, Illumination, Periodic variations, Optics

Graphs are presented giving data concerning the rising and setting of the Sun and Moon and the duration of twilight for high southern latitudes.

AD-626 303 Fld. 4/1, 20/4, 22/3
CFSTI Prices: HC $2.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS DEPT OF AERONAUTICAL AND ASTRONAUTICAL ENGINEERING
RADIATING FLOWS AROUND RE-ENTRY BODIES,
by Robert M. Nerem. Sep 65, 39p. Rept. no. Reprint no-1941-1
Contract AF33 (615)-2220
Unclassified report

Presented at the International Astronautical Congress (16th), Athens, Greece, 13-18 Sep 65.

Descriptors: (*Reentry vehicles, Gas flow), (*Atmosphere entry, Gas flow), Thermal radiation, Aerodynamic heating, Blunt bodies, Hypersonic flow, Heat transfer

Topics include: radiative transfer in a flowing gas, radiation from high temperature shock heated gases, the blunt body flow of a radiating gas, hypersonic slender body theory with radiation.

AD-626 471 Fld. 4/1
CFSTI Prices: HC $4.00 MF $1.00
EARTH SCIENCES DIV ARMY NATICK LABS MASS
AREAL DISTRIBUTION AND DIURNAL VARIATION OF WATER VAPOR NEAR THE GROUND IN THE CONTIGUOUS UNITED STATES.
Technical rept.,
by Arthur V. Dodd. Nov 65, 111p. Rept. no. ES-17
Proj. DA-1V025001A129
Unclassified report

Descriptors: (*Humidity, Climatology), (*Water vapor, Micrometeorology), (*Climatology, Humidity), Meteorological charts, Distribution, Dew point, Vapor pressure, Diurnal variations, Armed forces operations

Maps showing the distribution in the United States (except Hawaii and Alaska) of average monthly dew point and its standard deviation, average monthly vapor pressure, and types of diurnal variation and range of dew point are presented and discussed. The maps are based on hourly psychrometric observations at nearly 200 stations for lengths of record of about ten years. The principal features of the maps are evidence of different humidity controls in different areas of the country. The tendency toward east-west alignment of the isopleths in the East, the varied pattern approximating contours in the mountainous areas, and the north-south alignment of the isopleths near the West Coast reflect the differing controls. Four types of diurnal variation of dew point are defined based on the time of occurrence of the average minimum dew point. Type I is indicative of moisture availability at the earth's surface with highest dew points during the day. Type IV is found in dry areas and has lowest dew points during the day. Types II and III are transitional with both a morning and afternoon minimum of dew point in the daily cycle. Areas of the United States with differing humidity regimes are delineated in Part IV of the study. The areas, differentiated on the basis of average annual dew point and the range of average monthly dew points, reflect the dominant control of latitude in the East, altitude in the mountain states, and exposure on the West Coast. This final section serves to summarize the maps presented in the report. (Author)

AD-626 491 Fld. 4/1, 20/8
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
ON THE CONTRIBUTION OF SOLAR-FLARE ALPHA PARTICLES TO POLAR CAP ABSORPTION EVENTS.
Revised ed.,
by R. A. Weir, and R. R. Brown. 5 Mar 64, 8p.
Contract AF-AFOSR-422-62 Proj. AF-9774
Task 977402
AFOSR 65-1752
Unclassified report

Revision of manuscript submitted 4 Nov 1963.

Availability: Published in Journal of Geophysical Research v69 n11 p2193-8 Jun 1 1964. Copies to DDC users only.

Descriptors: (*Alpha particles, Solar flares), (*Solar flares, Ionospheric disturbances), Cosmic rays, Solar radiation, Ionization, Atmosphere, Polar regions, Geophysics

A series of calculations have been carried out to determine the relative importance of ionization from solar-flare alpha particles to polar cap absorption events. The exponential rigidity spectrums for solar-flare radiation discussed by Freier and Webber were used. To illustrate the actual magnitudes involved, typical fluxes, rigidity spectrums, and proton-alpha particle ratios from major polar cap events have been used. The electron production rates, electron densities, and specific absorption as a function of altitude for a proton-alpha particle ratio of unity are presented for a location with cutoff rigidity sub c P = 470 Mv. These results indicate that alpha particles contribute significantly, producing as much as 75 per cent of the ionospheric absorption when the proton-alpha particle ratio is unity. (Author)

A-626 492 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
A COMPARISON OF AURORAL LUMINOSITY AND IONOSPHERIC ABSORPTION USING WIDE-ANGLE MEASUREMENTS,
by R. R. Brown, and J. R. Barcus. 1963, 12p.
Contract AF-AFOSR-422-62 Proj. AF-9774
Task 977402
AFOSR 65-1759
Unclassified report

Availability: Published in Arkiv for Geofysik v4 n17 p395-403 1964. Copies to DDC users only.

Descriptors: (*Aurorae, Electron density), Luminescence, Ionosphere, Absorption, Cosmic rays, Magnetic storms, Riometers, Correlation techniques

A comparison of auroral luminosity variations over the antenna pattern of the 27.6 mc/s riometer at College, Alaska with ionospheric absorption records indicates, as noted earlier by other means, that ionospheric absorption is associated principally with the postbreakup phase of auroras. The lack of visible structure to the diffuse post-breakup aurora suggests that the fluctuations in the relation between auroral absorption and geomagnetic disturbance, as well as auroral luminosity and ionospheric absorption, are due to differences in the electron energy spectrum from event to event rather than spatial structure of the particle bombardment. (Author)

AD-626 502 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
BALLOON OBSERVATIONS ON THE RELATIONSHIP OF ENERGETIC ELECTRONS TO VISUAL AURORA AND AURORAL ABSORPTION.
Revised ed.,
by J. R. Barcus. 10 Feb 65, 15p. Contract AF-AFOSR-331-63
AFOSR 65-1879
Unclassified report

Revision of manuscript submitted 6 Oct 64.

Availability: Published in Journal of Geophysical Research v70 n9 p2135-47 May 1 1965. Copies to DDC users only.

Descriptors: (*Aurorae, Electron density), Luminescence, Excitation, Bremsstrahlung, X rays, Atmospheric sounding, Balloons, Geophysics

AD-626 503 Fld. 4/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
OBSERVATIONS ON THE SPATIAL STRUCTURE OF PULSATING ELECTRON PRECIPITATION ACCOMPANYING LOW FREQUENCY HYDROMAGNETIC DISTURBANCES IN THE AURORAL ZONE,
by J. R. Barcus, and T. J. Rosenberg. 2 Nov 64, 12p. Contract AF-AFOSR-331-63
AFOSR 65-1880
Unclassified report

Availability: Published in Journal of Geophysical Research v70 n7 p1707-16 Apr 1 1965. Copies to DDC users only.

Descriptors: (*Magnetohydrodynamics, Ionospheric distrubances), (*Ionospheric disturbances, Magnetohydrodynamics), Ionosphere, Absorption, Cosmic rays, Electron density, Bremsstrahlung, X rays, Geophysics, Polar regions

AD-626 506 Fld. 4/1
FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)
THE STRONGLY INTERACTING PARTICLES IN AIR SHOWER CORES,
by M. M. Winn, R. H. Wand, J. Ulrichs, M. H. Rathgeber, and P. C. Poole. 17 Aug 64, 35p.
Contract AF-AFOSR-305-63
AFOSR 65-1955
Unclassified report

Availability: Published in Il Nuovo Cimento v36 (Ser10) p701-32 1965. Copies to DDC users only.

Descriptors: (*Cosmic ray bursts, Nuclear reactions), Charged particles, Nuclear energy, Radiation measurement systems

AD-626 594 Fld. 4/1, 12/1
CFSTI Prices: HC $1.00 MF $0.50
BROWN UNIV PROVIDENCE R I
EXTENSIONS TO THEORY OF TIME SERIES ANALYSIS.
Quarterly rept. no. 1, 1 Aug-31 Oct 65,
by Walter Freiberger. 31 Oct 65, 12p. Contract DA-28-043-AMC-00183 (E)
Unclassified report

Descriptors: (*Meteorology, Stochastic processes), (*Statistical analysis, Meteorology), Series, Time

A discrete time stochastic meteorological model based on the presence of weather regimes is discussed.

AD-626 606 Fld. 4/1, 20/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON THE COLLISIONS OF VERY SMALL CLOUD DROPS,
by M. H. Davis. Jan 66, 13p. Rept. no. P-3268
Unclassified report

Prepared for presentation at Meeting of AMS, Reno, Nevada Oct 1965. See also AD-620 896.

Descriptors: (*Clouds, Hydrodynamics), (*Hydrodynamics, Raindrops), Spheres, Viscosity, Velocity, Drag

Conclusions: Some of the hydrodynamic force expressions used by Hocking (The collision efficiency of small drops, Quart. J. Roy. Met. Soc., 85, 44-50 (1959)) are incorrect for close droplet separations. His conclusions should therefore be regarded with suspicion. Preliminary results based on an improved Stokesian hydrodynamic theory show no evidence for the 19-micron collision efficiency cut-off. The Stokes approximation is inadequate at Reynolds numbers as small as 0.25 for nearly equal spheres. Its range of validity in the twosphere hydrodynamic problem should be investigated. (Author)

AD-626 632 Fld. 4/1, 20/6
CFSTI Prices: HC $1.00 MF $0.50
DENVER UNIV COLO DEPT OF PHYSICS
VARIATION WITH ALTITUDE OF THE TRANSMITTANCE OF THE EARTH'S ATMOSPHERE WITH GRATING RESOLUTION,
by David G. Murcray, Frank H. Murcray, and Walter J. Williams. Nov 65, 25p. Rept. no. Scientific-1
Contract AF19 (628)-5202 ,ARPA Order-363
Proj. AF-8662 Task 866201
AFCRL 65-854

Unclassified report

Descriptors: (*Atmosphere, Light transmission), (*Light transmission, Atmosphere), (*Solar radiation, Absorption spectrum), Solar spectrum, Spectra (Infrared), Measurement, Airborn, Balloons, Spectrum analyzers, Diffraction gratings

The solar spectrum in the region from 3150/cm to 3950/cm was measured at various altitudes from 1.6 km to 31 km using a balloon borne grating spectrometer system. The spectral transmittance of the atmosphere above certain altitudes were deduced from these spectra. The observed spectral transmittance was compared with the theoretical transmittance predicted by Plass considering only CO2 absorption. The comparisons agree well at 15 km. At 30 km. the absorption by H2O approximately equals the absorption by CO2 and the theoretical transmittance (estimated from CO2 only) differs from the observed. (Author)

AD-625 824 **See Fld. 3/1**

AD-625 897 **See Fld. 20/9**

AD-626 039 **See Fld. 8/14**

AD-626 044 **See Fld. 22/2**

AD-626 166 **See Fld. 20/14**

4/2. METEOROLOGY

AD-625 689 Fld. 4/2
CFSTI Prices: HC $2.00 MF $0.50
TRAVELERS RESEARCH CENTER INC HARTFORD CONN
RELATIONSHIPS BETWEEN TROPICAL PRECIPITATION AND KINEMATIC CLOUD MODELS.
Progress rept. no. 8, 15 Feb-15 Aug 65,
by Geirmundur Arnason, and Edward A. Newburg. Jan 66, 30p. Rept. no. 7469-178
Contract DA-28-043-AMC-01219 (E) Proj. DA-1VO-14501-B-53A-09
ECOM 01219-8

Unclassified report

Descriptors: (*Convection (Atmospheric), Numerical analysis), Tropical regions, Rainfall, Clouds, Mathematical models, Correlation techniques

Dry, shallow convection of the roll-type is simulated by means of numerical experiments. Initially, a buoyant bubble near the lower boundary is introduced into neutral surroundings, and the equations of motion, continuity, and thermodynamics are solved numerically to obtain the development in time of the bubble. The computed events show the bubble to rise at an accelerated rate and take the shape of a mushroom with a slim stem and a rounded top which is characterized by a concentration of isotherms. The associated toroidal circulation is that of a narrow intense updraft in the center, and a broad descending flow further out. The pressure field induced by the buoyant bubble is nonhydrostatic and, as such, is of particular interest. It creates inflow extending from the lower boundary to the core of the bubble and accelerates the inflowing air upwards along the stem. The pressure distribution is such that the bubble is exposed to a form drag similar to that on a body moving through a viscous fluid. The evolution of events spans a time period of twenty minutes. Near the end of this period, the bubble is approaching the upper boundary (3000m), the influence of which is becoming noticeable in the results. By then the initial temperature excess of 0.38C has diminished to 0.13C as a result of truncation errors of the finite difference scheme. It is concluded that the computed events are qualitatively in good agreement with observed behavior of dry convection in the atmosphere, and that the finite difference schemes that were used compensate to some degree for the neglected effects of friction and thermal diffusion in the system of physical equations used in the numerical experiment. (Author)

A-625 739 Fld. 4/2
CFSTI Prices: HC $3.00 MF $0.75
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
PROJECT LAKE EFFECT. A STUDY OF INTERACTIONS BETWEEN THE GREAT LAKES AND THE ATMOSPHERE.
Final rept. 1 Jul 64-1 Oct 65,
by George E. McVehil, and Robert L. Peace,Jr..
29 Oct 65, 64p. Rept. no. CAL-VC-1967-P-2
Contract DA-28-043-AMC-00306 (E) Proj. DA-1V0-1450-B-53A-06

Unclassified report

Descriptors: (*Snow, Great Lakes), (*Great Lakes, Marine meteorology), (*Marine meteorology, Great Lakes), Atmosphere, Water, Surface properties, Meteorological parameters, Atmospheric sounding

Analyses have been made of a number of recent cases of lake effect snowfall along the southern and eastern shores of Lake Erie. Synoptic analyses are presented to show the large-scale weather situations in which severe lake effect snowstorms occur, and also some of the mesoscale characteristics of the snow squall bands. Examples are included which show typical characteristics as they appeared in several different storms. Meso-analysis of a Lake Ontario storm reveals distinctive pressure, wind, and convergence patterns that are associated with Lake effect storms. (Author)

AD-625 760 Fld. 4/2, 17/9, 20/5
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS STATE WATER SURVEY URBANA ATMOSPHERIC SCIENCES SECTION
EVALUATION OF THE MASER-EQUIPPED RADAR SET AN/MPS-34 AND AREA PRECIPITATION MEASUREMENT INDICATOR.
Quarterly progress rept. no. 2, 1 Jul-30 Sep 65,
by R. E. Rinehart, and D. M. A. Jones. 30 Sep 65, 20p. Contract DA-28-043-AMC-01257 (E)
Proj. DA-1VO-25001-A126 Task 1VO-25001-A-126-03-19

Unclassified report

See also AD-623 468.

Descriptors: (*Meteorological radar, Masers), (*Masers, Meteorological radar), Atmospheric precipitation, Radar echo areas, Plan position indicators, Photographic recording systems, Weather forecasting, Effectiveness

Difficulties encountered with the Area Precipitation Measurement Indicator (APMI) and progress in overcoming these problems are discussed briefly. The MASER-equipped MPS-34 radar was operated during August near Magdalena, New Mexico, and 49-3/4 hours of data were collected of which 18 hours were on MASER mode. Nearly 700 feet of radar film collected on 19 days of operations are available for analysis. The MASER operation was limited by the occasional lack of helium, and for a short period by trouble with the pump klystron circuits. An addition was made to the elevation control system to provide smoother scanning in the RHI mode and to permit the RHI mode to be photographed through the same indicator system as the PPI mode. Analysis of data collected during August in New Mexico was limited to unusual echoes which appeared as coherent targets up to 42 db below full gain without the MASER operating. The conclusion is that these targets were birds. (Author)

AD-625 771 Fld. 4/2
CFSTI Prices: HC $2.00 MF $0.50
SANFORD RESEARCH INST MENLO PARK CALIF
ATMOSPHERIC WATER VAPOR MEASUREMENTS ON THE GREENLAND ICE CAP.
Final rept.,
by Elmer Robinson. 31 Oct 65, 49p. Contract DA-28-043-AMC-00130 (E) Proj. DA-1V0-14501-B-53A-05 ,SRI-PAU-5052

Unclassified report

Descriptors: (*Greenland, Humidity), (*Humidity, Greenland), (*Water vapor, Atmosphere), Arctic regions, Meteorology

Observations of ice cap humidity profiles were made over two periods of approximately one month each during the summers of 1964 and 1965 at Camp Century, Greenland. The Karl Fischer technique used for these observations gives a value of the total water vapor concentration integrated over a sampling period of up to 10 minutes. The accuracy of the system is 2 to 3%. The humidity profiles were obtained from the surface up to a height of 183 ft using the meteorological tower previously erected at Camp Century. Within the sampled layer, the humidity profile showed considerable change both on a day to day basis and on a diurnal cycle during a given day. The humidity profile was apparently tied in quite closely with the radiation balance of the snow surface. During storms and overcast conditions humidity conditions tended to be more uniform both in time and through the sampled layer. During situations with supercooled water fog, conditions tended to be supersaturated with respect to an ice or snow surface but not relative to a water surface. However, the number of fog situations observed were too few to justify any definitive conclusions. (Author)

AD-625 858 Fld. 4/2
CFSTI Prices: HC $3.00 MF $0.75
WEATHER SQUADRON (30TH) SAN FRANCISCO CALIF 96307
JANUARY CLIMATE OF SOUTHEAST ASIA.
Dec 65, 66p.

Unclassified report

Descriptors: (*Climatology, Southeast Asia), (*Southeast Asia, Climatology), Geography, Meteorology, Aeronautics

AD-625 873 Fld. 4/2, 22/2, 14/2
CFSTI Prices: HC $1.00 MF $0.50
SPACE/DEFENSE CORP BIRMINGHAM MICH
SEMI-ANNUAL STATUS REPORT, 15 JUNE 1965 THROUGH 15 DECEMBER 1965,
by Michael Brian. 22 Dec 65, 7p. Contract Nonr-5013 (00)

Unclassified report

Descriptors: (*Sounding rockets, Launching), (*Buoys, Rocket launchers), (*Marine meteorology, Sounding rockets), Feasibility studies, Naval equipment, Meteorological data

AD-625 888 Fld. 4/2
CFSTI Prices: HC $1.00 MF $0.50
MCGILL UNIV MONTREAL (QUEBEC) STORMY WEATHER GROUP
PRECIPITATION STUDIES BY RADAR AND OTHER TECHNIQUES.
Final rept. Jan 62-Aug 65,
by J. S. Marshall. Oct 65, 14p. Contract AF19 (628)-249 Proj. AF-8620 Task 862004
AFCRL 65-845

Unclassified report

Descriptors: (*Atmospheric precipitation, Radar scanning), (*Meteorological radar, Weather forecasting), (*Weather forecasting, Meteorological radar), Rainfall, Snow, Mapping

This Report covers the study of profiles derived from the stepped grey scale radar maps. The profiles, which are plots of the distribution of area and/or flux of precipitation with intensity as a function of height for a total area of 20,000 sq nmi, give useful data for relation to synoptic meteorology. The results of measurements of snowfall rate by measuring depth increments on the ground by optical attenuation in the falling snow are reported. (Author)

AD-625 889 Fld. 4/2, 17/2
CFSTI Prices: HC $1.00 MF $0.50
MCGILL UNIV MONTREAL (QUEBEC) STORMY WEATHER GROUP
WEATHER RADAR MAPS ON FACSIMILE AND NEW THEORETICAL STUDIES.
Final rept. Jan 63-Aug 65,
by J. S. Marshhaall. Oct 65, 14p. Contract AF19 (628)-2489 Proj. AF-6672 Task 667205
AFCRL 65-846

Unclassified report

Descriptors: (*Weather communications, Facsimile equipment), (*Facsimile equipment, Weather communications), (*Meteoorological radar, Facsimile recording systems), (*Weather forecasting, Meteorological radar), Clouds, Atmospheric precipitation, Mapping

This Final Report covers the period January 1963 to August 1965. It reviews the development in incorporation of facsimile reproduction and transmission of stepped grey scale weather radar maps into the McGill Weather Radar system. Theoretical studies in the reporting period found no reason for clouds to yield a smaller signal than that indicated by 'precipitation' theory. (Author)

AD-625 913 Fld. 4/2
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
THE DIURNAL VARIATION OF THE ABSOLUTE HUMIDITY IN THE ATMOSPHERE SURFACE BOUNDARY LAYER,
Research translation,
by I. I. Solomatina. Sep 65, 14p. Rept. no. T-R-384
Contract AF19 (628)-3880
TT 66-60174

Unclassified report

O Sutochnom Khode Absolyutnoi Vlazhnosti v Prizemnom Sloe Atmosfery, trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n94 p156-62 1960.

Descriptors: (*Humidity, Atmosphere), Diurnal variations, Boundary layer, Water vapor, Micrometeorology, USSR

The first section of this paper contains an analysis of experimental data obtained during special observations at the Koltushi station during the summers of 1957 and 1958. The second contains a theoretical solution of the problem of the diurnal variation of humidity, using the equation of eddy diffusion of water vapor. The eddy coefficient is assumed to be both height- and time-dependent. An example is given of the calculation of the diurnal variation of humidity, and the computational and experimental results are compared. (Author)

AD-625 964 Fld. 4/2
CFSTI Prices: HC $3.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METEOROLOGY
APPLICATION OF WEATHER RADAR TO INTENSITY OF SURFACE PRECIPITATION.
Final rept. 1 Sep 63-31 Aug 65,
by Pauline M. Austin. 31 Oct 65, 51p. Contract DA-36-039-AMC-02225 (E) Proj. 1V0-14501-B-53A-07-02

Unclassified report

Descriptors: (*Atmospheric precipitation, Radar scanning), (*Meteorological radar, Atmospheric precipitation), (*Weather forecasting, Meteorological radar), Meteorological instruments, Rainfall, Raindrops, Particle size, Counting methods, Radar equipment, Data processing systems

The purpose of the research under this contract is to investigate the accuracy with which measurements of precipitation may be made by radar and to develop instrumentation and techniques for improving such measurements. There are four aspects to the work: instrumentation, observations, data processing, and analysis and applications. The project has been operating three radars: an AN/CPS-9, an SCR-615-B, and a 3.2 cm experimental radar. Auxiliary equipment for the radars includes two delay-line sweep integrators. Work has continued on a data processor which is designed to reduce radar data to digital form. An experimental model was built of a device to count and size raindrops by measuring the terminal fall velcoities as they fall through a fixed vertical interval. Routine radar operations sampled the volume of atmosphere just above the recording rain gauges; drop size samples were obtained. Reduction of radar data to digital maps is being made and machine computations are made of the distribution and amounts of precipitation. From these two types of data the meso-scale characteristics of the precipitation are being deduced and are being compared with the large scale synoptic patterns. An analysis has been made of the problems encountered in measuring precipitation by radar, and is presented in Research Report No. 36. (Author)

AD-626 065 Fld. 4/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
ROLE OF ABSORBED RADIATION IN FORMING THE RADIATIVE BALANCE,
by T. G. Berlyand, and V. V. Mukhenberg. Dec 65, 20p. Rept. no. fstc-381-T65-563
TT 66-60184

Unclassified report

Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n139 p3-15 1963.

Descriptors: (*Solar radiation, Climatology), (*Climatology, Solar radiation), Earth (Planet), Absorption, Reflection, Heat flux, Geophysics, USSR

The absorbed radiation distribution patterns on the surface of the earth are studied using data from observations and computations. The connections between the absorbed radiation and the radiative balance, and also between the absorbed radiation and the air temperature, are considered. (Author)

AD-626 159 Fld. 4/2
CFSTI Prices: HC $3.00 MF $0.75
HONEYWELL INC MINNEAPOLIS MINN AERONAUTICAL DIV
RESULTS OF TEST PROGRAM ON AIRCRAFT DEW POINT HYGROMETER.
Final rept. May 64-Oct 65,
by J. E. Crowley, and S. F. Rohrbough. 15 Nov 65, 80p. Contract AF19 (628)-3285 Proj. AF-6020 Task 602002
AFCRL 65-873

Unclassified report

Descriptors: (*Hygrometers, Airborne), Performance (Engineering), Environmental tests, Altitude chambers, Flight testing, Low altitude, Dew Point

An aircraft dew-point hygrometer was evaluated to determine the operating limits of dew point, altitude, Mach number, ambient air temperature, response time, and repeatability. The unit was evaluated under the environmental conditions of MIL-E-5272E and flight tests were simulated in a humidity atmospheric chamber. The test results indicated that the test system is best suited for low altitude sampling from aircraft flying at low Mach numbers. System improvements needed to extend this altitude and Mach number were determined. The improved system should be limiteed to minimum dew points of -60F to avoid the increased response time occurring as dew point temperatures are decreased. (Author)

AD-626 325 Fld. 4/2
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS STATE WATER SURVEY URBANA
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
Interim rept. no. 2, 1 Apr-30 Sep 65,
by A. L. Sims, and E. A. Mueller. 30 Sep 65, 21p. Contract DA-28-043-AMC-00032 (E) Proj. DA-1Vo-14501-B-53A-07

Unclassified report

See also AD-623 409.

Descriptors: (*Atmospheric precipitation, Radar scanning), (*Radar echo areas, Atmospheric precipitation), (*Meteorological radar, Weather forecasting), (*Weather forecasting, Meteorological radar), Clouds, Rainfall, Raindrops, Particle size, Radar reflections, Correlation techniques

Analysis procedures and some results are reported of the study to determine an adequate sample size for dropsize studies. The variance of rainfall rates in eight cubic meter samples indicates that 90 percent of the time, an accuracy of =6 percent may be expected in calculations of rate. The computer programs have been completed for the study of short period rainfall rates. Frequency curves for a small amount of data are presented. Further data processing is continuing. Raindrop data collections and measurements have been completed. Analysis is continuing of the data from New Jersey and North Carolina. (Author)

AD-626 373 Fld. 4/2
GENOA UNIV (ITALY) ISTITUTO GEOFISICO E GEODETICO
ON LARGE THUNDERSTORMS IN THE MEDITERRANEAN AREA.
Final rept.,
by Mario Bossolasco, Ignazio Dagnini, Antonio Elenaand , and Mariagrazia Grilli. 1964, 16p.
Contract DA-91-591-EUC-2915

Unclassified report

Availability: Published in Geofisica and Meteorologia, Genoa, v14 n3|4 p55-68 1965. Copies to DDC users only.

Descriptors: (*Thunderstorms, Mediterranean Sea), Marine meterology, Storms, Atmospherics, Europe

AD-626 577 Fld. 4/2
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
TABULATION OF STANDARD ATMOSPHERES AT 1000-FOOT INTERVALS OF ALTITUDE,
by L. F. Fehlner, and E. V. Nice. Aug 58, 25p.
Rept. no. TG-313-2
Contract NOrd-7386
Unclassified report

See also AD-626 578.

Descriptors: (*Climatology, Standards), Tables, Altitudes, Polar regions, Tropical regions, Atmospheric temperature, Temperature, Pressure, Viscosity, Sound, Velocity, Atmosphere

AD-626 578 Fld. 4/2
CFSTI Prices: HC $4.00 MF $0.75
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
TABULATION OF STANDARD ATMOSPHERES AT 100-FOOT INTERVALS OF ALTITUDE,
by L. F. Fehlner, and E. V. Nice. Aug 58, 119p.
Rept. no. TG-313-1
Contract NOrd-7386
Unclassified report

See also AD-626 577.

Descriptors: (*Climatology, Standards), Tables, Altitude, Polar regions, Tropical regions, Atmospheric temperature, Temperature, Pressure, Viscosity, Sound, Velocity, Atmosphere

Contents: Table 1, Standard atmosphere of the International Civil Aviation Organization; Table 2, Cold atmosphere; Table 3, Hot atmosphere; Table 4, Polar atmosphere; Table 5, Tropical atmosphere.

AD-626 579 Fld. 4/2
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
INTERTROPICAL CONVERGENCE ZONE. METEOROLOGY,
by Harold S. Roth, David W. Rabenhorst, and Thomas A. Stansbury. Jan 58, 27p. Rept. no. TG-301
Contract NOrd-7386
Unclassified report

Descriptors: (*Marine meteorology, Central America), Climatology, Air mass analysis, Weather forecasting, Tropical regions, Atmospheric sounding, Research planes

The Intertropical Convergence Zone off the Pacific Coast of Central America was thoroughly examined during the period of 28 September to 14 October 1957, by aircraft from the Hurricane Hunters. Microwave radar and other accessory instrumentation were carried on these aircraft that could obtain three-dimensional patterns on cloud formations over thousands of square miles. Also, these radar obtained three-dimensional patterns on rain intensity of thunderstorms over this same area. A surface ship served as a weather stations to collect surface and upper air observations.

AD-626 613 Fld. 4/2
CFSTI Prices: HC $5.00 MF $1.00
ARMY MISSILE COMMAND REDSTONE ARSENAL ALA PHYSICAL SCIENCES LAB
WIND CLIMATOLOGY AT KWAJALEIN TEST SITE, KWAJALEIN, MARSHALL ISLANDS,
by Novella S. Billions. 5 Jan 66, 167p. Proj. DA-1X250205D614
AMC-RA RR-TR-66-1
Unclassified report

Descriptors: (*Climatology, Kwajalein Atoll), (*Wind, Kwajalein Atoll), (*Kwajalein Atoll, Wind), Atmospheric motion, Statistical data, Tables, Test facilities, Pacific Ocean Islands

This report presents a climatology of upper air wind data at the Kwajalein Test Site. Frequency distributions of scalar winds, zonal and meridional wind components, and wind shears are presented at 1-km altitude intervals for Kwajalein, Marshall Islands. The frequency distributions have been established for the monthly and annual reference periods. The statistical information is based on the observational period January 1956 through October 1963. (Author)

AD-626 621 Fld. 4/2
CFSTI Prices: HC $4.00 MF $0.75
UNITED AIRCRAFT CORP EAST HARTFORD CONN
PREDICTION OF WINTER AND SUMMER ANTICYCLONES.
Final rept. 1 Oct 64-30 Sep 65,
by Frederick P. Ostby, and Keith W. Veigas. Dec 65, 114p. Contract AF19 (628)-3437 Proj. AF-433L
ESD TR-65-478
Unclassified report

Subcontracted to Travelers Research Center, Inc., Hartford, Conn. pub. no. 7463-191.

Descriptors: (*Anticyclones, Mathematical prediction), Air mass analysis, Climatology, North America

This report presents results and equations for the 12-, 24-, and 36-hr prediction of anticyclone displacement and change in central pressure for the Northern Hemisphere. Separate sets of equations were derived for each of six areas. These equations yielded results that were generally superior to climatology when tested on independent data. The technique employed is similar to that used previously in deriving cyclone equations, i.e., it features a movingcoordinate grid system for predictor tabulation, and a screening-regression analysis for the derivation of the prediction equations. Additional equations were derived for winter anticyclones to specify the forecast difference in pressure between the anticyclone and each of eight surrounding grid points. Analysis of these differences leads to the construction of forecast pressure patterns surrounding the anticyclone center; initial results from feasibility testing were encouraging. (Author)

AD-626 630 Fld. 4/2
CFSTI Prices: HC $3.00 MF $0.75
WASHINGTON UNIV SEATTLE DEPT OF ATMOSPHERIC SCIENCES
TRANSFORMATION OFTHE ATMOSPHERIC BOUNDARY LAYER OVER INHOMOGENEOUS SURFACES,
by Mikio Miyake. Oct 65, 74p. Rept. no. Scientific-6
Contract Nonr-477 (24) Proj. NR-307-252
Unclassified report

Descriptors: (*Atmospheric motion, Turbulent boundary layer), (*Turbulent boundary layer, Atmospheric motion), Wind, Boundary layer, Thermodynamics, Meteorology, Arctic Ocean

A survey is given of previous theoretical investigations of the development of an internal boundary layer in turbulent flow over a surface of variable roughness. On the basis of Monin and Kazanski's plume propagation concept, a new formula is derived which predicts the growth of the internal boundary layer under diabatic conditions. Wind and temperature profiles observed in air flowing across an artificial pond on the surface of a sheet of sea ice (near Point Barrow, Alaska) are used to test the new model, and it is found to give at least a qualitative prediction of the features of the internal boundary layer. The direction in which further refinement of the theory seems promising is indicated. (Author)

AD-625 785 **See Fld. 14/2**

AD-626 062 **See Fld. 14/2**

5/1. ADMINISTRATION AND MANAGEMENT

AD-625 916 Fld. 5/1, 5/9, 20/6
SOUTHWESTERN COLL MEMPHIS TENN DEPT OF PHYSICS
OPTICAL PHYSICS RESEARCH IN A SMALL LIBERAL ARTS COLLEGE.
by J. H. Taylor. 31 May 63, 5p.
Unclassified report

Availability: Published in Applied Optics v2 n10 p1075-9 Oct 1963. Copies to DDC users only.

Descriptors: (*Research program administration, Optics), Physics laboratories, Instructors, Students, Universities

To encourage more activity in the field of optical physics in the small colleges the program at Southwestern is described. It is believed that the Southwestern program has been effective in motivating many undergraduate physics majors to pursue optical physics as a career in graduate school. The undergraduate is directly involved in the program. The small size of the staff has not been a handicap since the department is concerned only with this one research program. (Author)

AD-625 952 Fld. 5/1, 11/9, 7/4, 20/8, +
CFSTI Prices: HC $3.00 MF $0.75
NAVAL ORDNANCE LAB CORONA CALIF
FOUNDATION RESEARCH PROJECTS.
Quarterly progress rept. for Jul-Sep 65.
15 Dec 65, 96p. Task R360-FR-104/211-1/R011-01-01
NAVWEPS 8833
Unclassified report

See also AD-620 865.

Descriptors: (*Heat-resistant polymers, Preparation), (*Infrared spectroscopy, Line spectrum), (*Plasma physics, Energy conversion), (*Semiconductors, Optical properties), (*Crystals, Spectroscopy), Organic phosphorus compounds, Condensation reactions, Pyrolysis, Phosphine, Polymerization, Mercury, Atomic spectroscopy, Cesium, Magneto-optic effect, Germanium, Garnet, Cerium, Ytterbium, Phosphonitrile chlorides

Contents: Condensation reactions of hexaphenyl dichloro phosphonitrile tetramer with diols and diamines, by D. L. Herring, C. M. Douglas, and A. J. Bilbo; A study of the thermal decomposition of trans-2,6-diazido hexaphenyl cyclophosphonitrile tetramer and further studies on the solvent polymerization of the tetramer with bisphosphines, by C. M. Sharts; The first spectrum of mercury in the 3.2to 4.0-micron region, by C. J. Humphreys and E. Paul, Jr. Note on Cesium I, by C. J. Humphreys and E. Paul, Jr.; Production of high power pulses by magnetic field compression, by R. L. Conger, J. H. Johnson, L. T. Long, andJ. A. Parks; Accurate measurement of small rotary dispersion, by C. J. Gabriel and H. Piller; Ellipticity in multiply reflected faraday rotation, by C. J. Gabriel and H. Piller; Optical constants of germanium in spectral regions from 0.5 to 3.0 eV, by R. F. Potter; Crystal field effects for Ce (3+) and Yb (3+) in the garnets, by G. F. Herrmann, J. J. Pearson, K. A. Wickersheim, and R. A. Buchanan.

AD-625 984 Fld. 5/1, 5/3
CFSTI Prices: HC $2.00 MF $0.50
ARMY MISSILE COMMAND REDSTONE ARSENAL ALA DIRECTORATE OF PROCUREMENT AND PRODUCTION
VALUE ENGINEERING AND EXPERIENCE CURVE PREDICTIONS,
by Robert W. Kelley. 10 Sep 65, 31p.
Unclassified report

See also AD-612 802, AD-612 803, AD-612 804, and AD-617 133.

Descriptors: (*Armed forces procurement, Production control), Procurement, Costs, Engineering, Graphics, Management control systems, Economics

The booklet illustrates situations in which experience curve techniques may be applied as an aid in analyzing a VECP (proposal by a contractor for a change in a value engineering clause). The booklet deals with general situations which one might incur in dealing with value engineering problems. The method of dealing with the experience curve techniques and value engineering problems to state a problem in terms of specific figures and give a sample solution using these figures. The formal equations and theory used for the solutions are given in a separate section from the examples. The solutions are directed toward obtaining the total savings and the average savings per unit for some given quantity as the result of a value engineering change made at some point in production.

AD-626 032 Fld. 5/1, 9/2
CFSTI Prices: HC $7.00 MF $1.50
BALLISTIC SYSTEMS DIV NORTON AFB CALIF
PROCEEDINGS OF AIR FORCE/INDUSTRY DATA MANAGEMENT SYMPOSIUM, SEPTEMBER 28, 29 AND 30, 1965, HELD AT BEVERLY HILTON HOTEL, BEVERLY HILLS, CALIFORNIA.
1965, 336p.

Unclassified report

Descriptors: (*Data, Management control systems), (*Management control systems, Symposia), (*Air force, Management control systems), Industries, Costs, Data processing systems, Data storage systems, Information retrieval, Air force procurement

The objectives of the Air Force/Industry Data Management Symposium were: (1) to re-examine the objectives of data management system; (2) to explore and evaluate the effectiveness of data management and control; (3) to determine and resolve existing problem areas; and (4) to increase the effectiveness of data management. To accomplish these objectives, the data management spectrum was divided into five categories: data management concepts, contractor data acquistion, rights in data and warranty cost of data, and new frontiers of data management. Based on this division, the Symposium was organized into five operating panels, each jointly chaired by an Air Force and an Industry representative. Each panel was further organized into detailed topic areas with members assigned to analyze, study, and develop tentative findings for consideration at the panel sessions. These findings were presented at the Symposium panel meetings. The ensuing panel discussions provided a basis for formulating recommended solutions to the various problems.

AD-626 072 Fld. 5/1, 15/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE INSIDE STORY OF AMERICA'S RAND CORPORATION (AND) INTRODUCING FOREIGN ESSAYS (AND) PENTAGON'S ACCOMPLICE, AMERICAN MILITARY RESEARCH ORGANIZATION 'RAND CORPORATION',
by Hsiao Feng, and Yan Hua. 25 Oct 64, 20p.
Rept. no. LT-64-71
TT 66-60191

Unclassified report

Trans. of Shih Chieh Chih Shih (Chinese People's Republic) n10 p22-3 1961; n21 p24-6 1963, and from Kunag Ming Jih Pao (Chinese People's Republic) 17 Aug p4 1964.

Descriptors: (*Scientific research, United States), (*National defense, Scientific organizations), (*Scientific organizations, Operations research), (*Operations research, Air force), Research program administration, Department of Defense, Aircraft industry, China

Translations are given of three articles appearing in the press of the Chinese People's Republic that concern the RAND Corporation. The 1961 article is 'The inside story of America's Rand Corporation' and is from the periodical 'World Knowledge'. This article has the following sections: Inside a building in Santa Monica: For servicing expansion of armaments and war readiness; Tool used exclusively by the big arms dealers; and Pentagon's most popular and hot thing. The 1963 article is also from 'World Knowledge' and has the title 'Introducing Foreign Essays.' The 1964 article from the 'Bright Daily' or 'Light Daily' is on the 'Pentagon's accomplice---American military research organization 'Rand Corporation.' These articles are said to have been based on articles in the Sep. 1963 'Atlantic Monthly,' Jan. 14, 1961 'Economist.' and Nov. 13, 1948 'Business Week', copies of the last two being attached.

AD-625 712 **See Fld. 14/2**

AD-625 728 **See Fld. 9/2**

AD-625 985 **See Fld. 13/12**

5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

AD-625 905 Fld. 5/2
CFSTI Prices: HC $3.00 MF $0.75
COLORADO UNIV BOULDER
DISSEMINATION RESEARCH.
Final technical rept. Jul 64-Jul 65,
by Peter G. Ossorio. Dec 65, 85p. Contract AF30 (602)-3432 Proj. AF-4594 Task 459401 RADC TR-65-314

Unclassified report

Descriptors: (*Information retrieval, Classification), (*Classification, Information retrieval), (*Reports, Dissemination), (*Dissemination, Scientific research), Subject indexing, Linguistics, Data processing systems, Computational linguistics, Syntax, Factor analysis, Automatic, Semantics

A description is given of the initiation of an operational dissemination system based on the Classification Space methodology developed previously, (AD-608 034). A set of three evaluational studies, now in progress, is described. A report is made of the empirical results of three semantic studies designed to form the basis for complementing the Classification Space by providing a capability for indexing and dissemination in terms of the conceptual content of documents or other textual units. Recommendations for the further development of the dissemination system and for the further application of pragmatic methodology in linguistic data processing are made. (Author)

AD-625 924 Fld. 5/2, 9/2
CFSTI Prices: HC $2.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
A MULTIPLE TESTING OF THE ABC METHOD AND THE DEVELOPMENT OF A SECOND-GENERATION MODEL. PART II. TEST RESULTS AND AN ANALYSIS OF RECALL RATIO,
by Berthold Altmann. Oct 65, 35p. Rept. no. TR-1296
Proj. HDL-01201 ,DA-1L013001A91A

Unclassified report

See also AD-617 118.

Descriptors: (*Information retrieval, Analysis), (*Subject indexing, Analysis), Statistical analysis, Mathematical models, Tests, Reports, Effectiveness, Computers

After a brief summary of the test program, the statistical results tabulated as overall 'ABC-relevance ratios' and 'ABC-recall figures' are presented and reviewed. An abstract model developed in accordance with Max Weber's 'idealtypus' (Die Objektivitat sozial wissenschaftlicher und sozialpolitischer erkenntnis; in Gesammelte aufsatze zur wissenschaftslehre, 1922, pages 174, 179, 190-191, 194) is used in discussion such observations as the absence of an inverse relationship of relevance and recall ratios. The increase of recall in proportion to the number of documents located is attributed to the ABC-system's peculiar capability of making the user an integral part of the system. (Author)

AD-626 090 Fld. 5/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
SELECTED OFFICIAL PUBLICATIONS, PROFESSIONAL PAPERS AND PATENTS.
Oct 65, 42p. Rept. no. NOTS-TP-3821

Unclassified report

See also AD-612 507.

Descriptors: (*Reports, Abstracts), (*Military publications, Naval Research), (*Patents, Naval research), (*Naval research, Reports), Bibliographies, Indexes

AD-626 145 Fld. 5/2, 9/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
LIBRARY INFORMATION SEARCH AND RETRIEVAL DATA SYSTEM (LISARDS),
by J. L. Zaharias. Nov 65, 41p. Rept. no. NOTS-TP-3934

Unclassified report

Descriptors: (*Information retrieval, Programming (Computers)), (*Libraries, Automation), Subject indexing, Catalogs, Records, Magnetic tape

A series of report literature-searching programs has been written for the IBM 7094 computer at the U. S. Naval Ordnance Test Station, China Lake, for use in the technical library to augment manual literature-searching techniques. In addition to the programs written in direct support of the searching activity, several programs have been written to decrease the time needed for sorting other library records. These auxiliary computer programs include the automatic posting of new reports in the manual coordinate index according to descriptors, the printing of the authority file used by indexers, and the preparation of 3x5-inch catalog cards. This report discusses indexing and literature-searching routines, and the evolution of the computer retrieval system. Programs written for the computer, and the procedures for using them, are presented. (Author)

AD-626 555 Fld. 5/2, 9/2
INSTITUTE FOR SCIENTIFIC INFORMATION INC PHILADELPHIA PA
AUTOMATIC SUBJECT RECOGNITION IN SCIENTIFIC PAPERS: AN EMPIRICAL STUDY,
by John O'Connor. May 65, 29p. Contract Nonr-4183 (00) ,AF49 (638)-1300 Proj. NR-049-186 ,AF9769 Task 976902

Unclassified report

Availability: Published in Journal of the Association for Computing Machinery v12 n4 p490-515 Oct 1965. Copies to DDC users only.

Descriptors: (*Subject indexing, Automatic), (*Information retrieval, Subject indexing), Digital computers, Tests, Language, Syntax, Statistical analysis

Two subject index terms (toxicity and penicillin) from an operating retrieval system were studied

intensively to determine how well a computer could assign them. The humanly produced indexing for the system was used as a standard, with some checking for indexer errors. Thesaurus rules failed to identify one fourth of the toxicity papers. A new rule, using 'connection forms', worked for almost all of the nonthesaurus papers. The combined rules identified toxicity papers as well as or better than the human indexers. However, these rules falsely selected as many papers as they correctly identified. False selection was reduced to this level by the use of two new indexing rules, relative frequency, and two methods previously proposed but not tested. The latter are emphasis measures by syntactic centrality and by first sentence-first paragraph position. The rules for reducing false selection did not work as well for penicillin as for toxicity. Comparisons are made with previous empirical studies. Some possible limitations of thesaurus methods, statistical association, etc. are indicated. Some affirmative suggestions are also made. (Author)

AD-625 712 See Fld. 14/2

AD-625 724 See Fld. 14/4

AD-625 759 See Fld. 6/16

AD-626 380 See Fld. 17/10

AD-626 382 See Fld. 17/10

5/3. ECONOMICS

AD-625 691 Fld. 5/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
FULL EMPLOYMENT POLICY AND ECONOMIC GROWTH,
by Richard R. Nelson. Dec 65, 23p. Rept. no. P-3072
Unclassified report

Descriptors: (*Economics, Employment), (*Employment, Economics), Labor, Production, Stabilization, Money, Equations, Mathematical models

The paper explores how the rate of labor force growth and the pace of technical advance rate influence the fiscal and monetary policies needed to maintain equality of aggregate demand and potential output. The aggregative model attempts to tie together two strands of analysis that have developed in the literature--a neoclassical strand stemming from Solow's work on the determinants of growth of potential output and a neo-Keynesian strand stemming from the Harrod-Domar studies of the conditions under which full employment can be maintained in a growing economy. (Author)

AD-626 216 Fld. 5/3
CFSTI Prices: HC $2.00 MF $0.50
CALIFORNIA UNIV BERKELEY DEPT OF GEOGRAPHY
STATISTICAL SERIES ON THE COLOMBIAN ECONOMY,
by William McGreevey. 1964, 35p. Contract Nonr-3656 (03) Proj. NR-388-067
Unclassified report

Descriptors: (*Columbia, Economics), (*Economics, Colombia), Population, Statistical data, Commerce, Industrial production, Tables

Statistical data are given on population, foreign trade, transportation, industry, and aggregate output.

AD-625 984 See Fld. 5/1

AD-626 107 See Fld. 22/2

AD-626 244 See Fld. 13/2

AD-626 250 See Fld. 8/6

AD-626 605 See Fld. 15/3

5/4. HISTORY, LAW AND POLITICAL SCIENCE

AD-626 073 Fld. 5/4, 15/6
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON THE ESSENCE OF A NUCLEAR-MISSILE WAR,
by E. Rybkin. Dec 65, 20p. Rept. no. LT-65-104
TT 66-60192
Unclassified report

O Sushchnosti Mirovoi Raketno-Yadernoi Voiny. Trans. of Kommunist Vooruzhennykh Sil (USSR) n17 p50-5 1965.

Descriptors: (*Political science, Nuclear warfare), (*Nuclear warfare, Political science), Nuclear weapons, Cold war, Economics, Public opinion, Sociology, USSR

It is concluded that nuclear war because of its consequences transcends the framework of previous ideas regarding the correlation of politics and war. Still remaining a continuation of politics, nuclear war due to the consequences of the use of atomic weapons is now circumscribed as an instrument of politics. This fact does not negate either the possibility of the aggressors unleashing a war nor the possibility of our victory in the war. The chief conclusion derived from the analysis of this problem is that it is necessary to do everything in order to avert a world nuclear war.

AD-626 106 Fld. 5/4, 15/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE HERIOC DEFENSE OF LENINGRAD AS INTERPRETED BY AN AMERICAN HISTORIAN,
by V. M. Kovalchuk, and G. L. Sobolev. Dec 65, 9p. Rept. no. LT-65-107
TT 66-60199
Unclassified report

Trans. of Voprosy Istorii (USSR) n12 p156-8 1963.

Descriptors: (*Warfare, History), (*USSR, Warfare), Defense systems, Urban areas, Reviews

AD-626 075 See Fld. 15/7

AD-626 077 See Fld. 15/7

AD-626 139 See Fld. 2/2

AD-626 250 See Fld. 8/6

5/5. HUMAN FACTORS ENGINEERING

AD-626 610 Fld. 5/5, 22/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
THE EFFECTS OF CONTROL LOCATION UPON PERFORMANCE TIME FOR KNOB, TOGGLE SWITCH, AND PUSH BUTTON.
Final rept., Mar-Jun 62,
by Earl D. Sharp, and John P. Hornseth. Oct 65, 22p. Rept. no. AMRL-TR-65-41
Proj. AF-7184 Task 718405
Unclassified report

Descriptors: (*Performance (Human), Control panels), (*Control panels, Performance tests), Time studies, Control knobs, Toggle switches, Anthropometry, Spacecraft

Nine subjects, each restrained in an aircraft seat, operated (with their left hand) each of three controls (knob, toggle switch, and push button) at each of 36 locations. Performance time scores for each of the controls were compared and 'contour maps' were constructed to display performance-location relationships. These contour maps show that the fastest performance time area for all controls is approximately 25 degrees to the left of the midsagittal plane and 25 inches above the seat reference point. The fast-performance area for the toggle switch is considerably smaller than that for the knob or push button, suggesting that the selection of a location for a toggle switch may represent a more critical design problem. An analysis of variance of the performance data provided additional comparisons in terms of the effect of angular displacement and console array distance. (Author)

AD-626 638 Fld. 5/5, 5/10
CFSTI Prices: HC $4.00 MF $1.00
BUNKER-RAMO CORP CANOGA PARK CALIF SYSTEMS EFFECTIVENESS DEPT
DEVELOPMENT OF TESTS TO MEASURE THE UTILIZATION OF HUMAN FACTORS INFORMATION BY DESIGNERS.
Technical rept. for 15 Jun-15 Dec 65,
by David Meister, and Donald E. Farr. 16 Dec 65, 138p. Contract Nonr-4974 (00)
Unclassified report

Descriptors: (*Human engineering, Design), (*Test construction (Psychology), Human engineering), Personnel, Performance (Human), Tests, Applied psychology, Attitudes, Behavior, Problem solving, Specifications, Analysis, Effectiveness, Systems engineering, Handbooks

The report describes three 4-hour tests developed to determine how human factors information is utilized by designers. It is assumed that greater knowledge of the design process will enable human factors (and other) specialists to communicate more adequately with design personnel and in particular will improve the characteristics of human engineering handbooks written for designers. An appendix to this report presents a theory of design activity in behavioral terms. The tests consist of a series of design problems to which designers must respond by developing conceptual sketches and answering questions concerning the manner in which they use available information. In the first type of test (Design Product Tests I and II) the subject is given system requirements and asked to lay out an equipment which will satisfy those requirements. In the second type of test (Design Input Test) the subject is given a series of design problems and asked what information he needs and how he would use that information to solve these problems. The difference between the tests is largely a matter of the approach taken; the Design Product Tests represent a longitudinal attack on the designer's behavior, since they cover all of the latter's activity from presentation of the problem to its resolution. The Design Input Test concentrates on individual aspects of the design problem and the designer's analysis of pertinent information. The tests are given individually.

AD-625 828 See Fld. 5/9

AD-625 919 See Fld. 5/10

AD-626 036 See Fld. 1/4

5/6. HUMANITIES

AD-626 367 See Fld. 5/10

5/7. LINGUISTICS

AD-625 777 Fld. 5/7, 9/2
CFSTI Prices: HC $4.00 MF $0.75
THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y
LOGICAL-LINGUISTIC STUDIES FOR MACHINE TEXT PERUSAL. (PROJECT LOGOS).

Semiannual technical status rept. 1 May-31 Dec 63,
by Herbert G. Bohnert. 31 Dec 63, 102p. Contract AF49 (638)-1198

Unclassified report

Descriptors: (*Grammars, Data processing systems), (*English language, Analysis), Dictionaries, Information retrieval, Computational linguistics

Project LOGOS analyzes the logic of natural language grammar with a double aim. The first is the practical one of constructing artificial languages with certain desirable features for use in certain kinds of automatic information retrieval. The second is the scientific one of providing a new approach to the understanding of language itself. (Author)

AD-625 954 Fld. 5/7
CFSTI Prices: HC $4.00 MF $1.00
WAYNE STATE UNIV DETROIT MICH
PREREQUISITES TO SYNTACTIC RECOGNITION IN RUSSIAN: CLAUSE NUCLEI.
Research in machine translation,
by Ladislav Matejka. May 65, 135p. Contract Nonr-2562 (00)

Unclassified report

Descriptors: (*Russian language, Syntax), Machine translation

It is evident that recognition of the syntactic role of the forms of clauses requires a strategical application of the grammatical rules underlying Russian sentences. The hierarchical application of these rules makes it possible to deal systematically with highly developed syntactic structures and to avoid the burgeoning complexities typical for those attempts which disregard the hierarchical structuring of natural languages. (Author)

AD-626 207 Fld. 5/7
CFSTI Prices: HC $6.00 MF $1.25
RAND CORP SANTA MONICA CALIF
STUDIES ON PREDICATION IN RUSSIAN, II. ON THE PREDICATIVE USE OF THE RUSSIAN INFINITIVE,
by Henrik Birnbaum. Dec 65, 257p. Rept. no. RM-4477-PR
Contract AF49 (638)-1700

Unclassified report

See also AD-429 524.

Descriptors: (*Russian language, Grammars), Machine translation, Transformational grammar

The second part of a study on the complex function of predication and its formal expression in Contemporary Standard Russian (CSR). This Memorandum discusses the predicative use of the Russian infinitive against the background of its entire range of functions (the 'semantic spectrum'). The author surveys the predicative and semi-predicative use of the Russian infinitive; studies its peculiarities by applying certain transformational procedures; and discusses how it expresses predicative categories of time, modality, person, aspect, mode of action. Some suggestions for automatically translating Russian predicative infinitives are included. (Author)

AD-626 262 Fld. 5/7, 5/9
CFSTI Prices: HC $3.00 MF $0.75
HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA
A SELF-INSTRUCTIONAL TACTICAL LANGUAGE COURSE IN RUSSIAN,
by Eugene H. Rocklyn. Dec 65, 74p. Rept. no. TR-65-14
Contract DA-44-188-ARO-2 Proj. DA-2J02401A712-01

Unclassified report

Descriptors: (*Russian language, Programmed instruction), Education, Teaching methods, Military tactics, Instruction manuals, Vocabulary

To enable the combat soldier to obtain perishable, tactical information from newly captured prisoners of war, a brief, self-instructional Russian language course was developed and evaluated. Materials obtained from questionnaires administered of combat-experienced personnel were reviewed and refined, resulting in a final version of course content that covered areas of information likely to be used in any offensive or defensive questioning situation. The course was taken by 13 students having language aptitudes ranging from 0 to the 97th percentile on the Army Language Aptitude Test. Upon completion, they were tested on content acquisition of all material in the course and on ability to use the material to obtain information from native Russians during simulated combat-area questioning. The results were a mean of 93% correct for speaking and understanding Russian and an 89% mean in translating answers given by the Russians, thus demonstrating the feasibility of such a course. The structure and questioning techniques seem effective in helping to elicit understandable answers from nonEnglish-speaking personnel and may serve as a basis for development of similar courses in other languages. (Author)

AD-626 364 Fld. 5/7
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
SYMPOSIUM: PHILOSOPHY AND LINGUISTICS. THE RELEVANCE OF LINGUISTICS TO PHILOSOPHY,
by Jerrold J. Katz. 1965, 14p. Contract DA-36-039-AMC-02300 (E),Grant NSF-GP-2495

Unclassified report

To be presented in a symposium on 'Philosophy and Linguistics' at the annual meeting of the APA, (62nd) Eastern Division, Dec 29, 1965.

Availability: Published in The Journal of Philosophy, p590-602 1965. Copies to DDC users only.

Descriptors: (*Linguistics, Theory), Language, Syntax, Psychology, Grammars

The relevance of linguistics to philosophy is defended on the grounds that linguistic theory incorporates solutions to significant philosophical problems. The defense shows that a number of philosophical problems can be represented as questions about the nature of language, and that, so represented, they can be solved by conceptual constructions found in linguistic theory. The justification of these solutions is provided by the same evidence that warrants the introduction of such conceptual constructions into linguistic theory. The thesis is not that the linguist's description of locutions from natural languages reveals philosophical insights that somehow escape philosophers. It is rather that conceptual constructions, initially devised to enable linguistic theory to state uniformities in natural languages systematically, also fulfill the conditions on solutions to certain philosophical problems. If this defense proves successful, linguistics is not incidentally pertinent to philosophy in the way that philosophy of science bears upon the clarification of methodology and theory construction in linguistics, but is directly relevant in the same way that philosophical theories themselves are.

AD-626 472 Fld. 5/7, 9/2
CFSTI Prices: HC $7.00 MF $1.50
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
A HEURISTIC DERIVATION SEEKER FOR UNIFORM PREFIX LANGUAGES.
Master's thesis,
by Gerhard Chroust. Sep 65, 310p. Rept. no. 66-13
Contract DA-31-124-ARO (D)-98 Grant ,NSF-GP-1476 Proj. DA-20011501B704
AROD 4166:7

Unclassified report

Descriptors: (*Languages, Programming (Computers), (*Programming (Computers), Languages), Classification, Specifications, Transformational grammars, Syntax, Algorithms, Theorems, Programming languages, Digital computers, Linguistics

The paper describes the theoretical background and the realization of a program which tries to find the derivation of a prefix word ('the problem') for some classes of uniform prefix languages. The program can be applied to different language specifications which may contain a base alphabet, defined symbols, axioms, a substitution rule and transformation rules. The specification is similar to formalized logic, but is capable of expressing a much broader class of languages. The program reduces the problem to a Syntactic Normal Form and tries to find its derivation from the ad hoc productions of the language by using a heuristic goal-subgoal method (i.e., one which does not guarantee success, but usually results in better performance). The paper also contains a proof that it is sufficient to work with the Normal Form instead of the original problem. (Author)

AD-626 480 Fld. 5/7
CFSTI Prices: HC $5.00 MF $1.00
BUNKER-RAMO CORP CANOGA PARK CALIF
A SYNTACTIC ANALYZER STUDY.
Final rept. 1 Jul 64-30 Jun 65,
by Paul L. Garvin. Dec 65, 187p. Contract AF30 (602)-3506 Proj. AF-4599
RADC TR-65-309

Unclassified report

Descriptors: (*Syntax, Analysis), (*Machine translation, Syntax), Grammars, Transformational grammars, Language, Linguistics

The report documents work performed in the area of machine translation R and D. The aim of this work was twofold: (1) evaluation of formal and descriptive grammars from the viewpoint of their applicability to machine aided translation of natural languages, and (2) development of an operational grammar (syntactic recognition routine) for purposes of machine aided translation. The operational grammar is based partly on lessons derived from the aforementioned evaluation of grammatical theories. Results of the evaluation of grammar are reported in the body of the report and in a series of appendices. They have led to a confirmation and improvement of the 'fulcrum approach' to language data processing and machine translation. Operational grammar described in the report is a further development and improvement of the previous machine translation program based on 'fulcrum grammar. (AD-235 964, AD-256 355). (Author)

AD-626 572 Fld. 5/7
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
STUDIES IN INTER-SENTENCE CONNECTION,
by Kenneth E. Harper. Dec 65, 21p. Rept. no. RM-4828-PR
Contract AF49 (638)-1700

Unclassified report

Descriptors: (*Russian language, Analysis), Word association, Machine translation, Abstracts, Processing Syntax

A systematic analysis of portions of the Russian physics text processed at RAND, to determine the extent of repetition in adjacent sentences. Recurrence of words in all pairs of contiguous sentences in the text (2467 pairs) was recorded in a machine printout; sentence pairs for which word recurrence was not automatically recorded were visually inspected for other types of recurrence (through lexical stems, pronouns, synonyms, and paraphrases). The extent of the different types of

recurrence is reported, and features of the recurring items are discussed. Sentence pairs characterized by nonrecurrence (12 percent of the total) are examined, and the relevance of inter-sentence recurrence and nonrecurrence to automatic syntactic analysis and abstracting is suggested. (Author)

AD-626 143 See Fld. 9/2

5/8. MAN-MACHINE RELATIONS

AD-626 173 Fld. 5/8, 6/4
CFSTI Prices: HC $3.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
DESIGNING A MACHINE PARTNER-PROSPECTS AND PROBLEMS.
Professional paper,
by Aiko Hormann. 15 Oct 65, 57p. Rept. no. SP-2169/000/01
Contract Nonr-4745 (00)
Unclassified report

Descriptors: (*Man-machine systems, Design), Computers, Data processing systems, Problem solving, Programming (Computers), Behavior, Feedback, Learning, Adaptive systems, Artificial intelligence, Computer storage devices, Memory

Discusses some possibilities for extending man's intellectual and creative power through 'partnership' with machines of increased responsiveness and sophistication. Some of the general requirements for a machine partner are stated--requirements that are likely to differ depending on the human users, their purposes, and the situations. Some of the different problem domains are discussed, and reasons are given for handling some problems by machine alone, some by a man/machine team, and still others by man alone. The paper also discusses the conceptual and technical difficulties that must be overcome before the machine can become a partner to man, rather than his simple-minded servant. The paper suggests the possibility of having 'ideation sessions' with a machine partner in problem situations requiring new ideas. The machine's contribution might be greatest in the second phase of problem solving, i.e., the judicious evaluation of ideas and the selection of fruitful ones from a large volume of diverse ideas, both good and bad. The paper also discusses some hurdles that must be crossed before man can enjoy the benefits of machines worthy of the name 'partner.' (Author)

AD-626 311 Fld. 5/8
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
ON THE ALLOCATION OF FUNCTIONS BETWEEN MEN AND MACHINES,
by Alphonse Chapanis. 1965, 12p. Rept. no. 8
Contract Nonr-4010 (03)
Unclassified report

Availability: Published in Occupational Psychology v39 n1 p1-11 Jan 1965. Copies to DDC users only.

Descriptors: (*Man-machine systems, Systems engineering), Distribution, Decision theory, Operations research, Scheduling, Effectiveness, Human engineering

AD-626 554 Fld. 5/8, 9/2
MASSACHUSETTS INST OF TECH CAMBRIDGE ELECTRONIC SYSTEMS LAB
THE BEAM PEN: A NOVEL HIGH-SPEED, INPUT/OUTPUT DEVICE FOR CATHODE-RAY-TUBE DISPLAY SYSTEMS,
by Donald R. Haring. 1963, 11p. Contract Nonr-4102 (01)
Unclassified report

Availability: Published in Proceedings-Fall Joint Computer Conference p847-55 1965. Copies to DDC users only.

Descriptors: (*Man-machine systems, Input-output devices), (*Cathode ray tube screens, Input-output devices), Electron beams, Display systems, Probes (Electromagnetic)

The beam-pen system is for detecting the electron beam that causes lighted spots on a CRT computer display. The beam-pen system consists of the following units: A pulse modulator to intensity modulate (approximately 100 percent) the CRT beam with a 10-megacycle signal. The beam pen itself, a hand-held, high-input-impedance pickup consisting of a shielded conductive probe and a preamplifier to pick up the electron-beam signal. A broad band-pass 10megacycle amplifier to amplify the beam-pen output. An envelope detector to remove the 10-megacycle carrier. A pulse amplifier to drive the threshold detector and produce signals compatible with the CRT signals. A threshold detector to produce a digital output.

AD-626 155 See Fld. 9/2

5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

AD-625 828 Fld. 5/9, 5/5
CFSTI Prices: HC $3.00 MF $0.75
DUNLAP AND ASSOCIATES INC WASHINGTON D C
HANDBOOK FOR THE CONSIDERATION OF TRAINING FUNCTIONS DURING DESIGN OF OPERATIONAL EQUIPMENT.
Final rept.,
by R. Gebhard, J. M. Gradijan, and F. A. Brooks, Jr.. 8 Jul 65, 82p. Contract N61339-1450 Proj. 7675
NAVTRADEVCEN 1450-2
Unclassified report

See also AD-625 129.

Descriptors: (*Weapon systems, Training devices), (*Training devices, Human engineering), Handbooks, Military training, Design, Cost effectiveness, Performance (Human), Military personnel, Learning

The handbook was prepared on a one-year study of how training considerations should be made during operational system design. For many systems, categories of operations can be defined according to whether on-system practice will normally be provided during mission fulfillment; can be provided at some degradation to mission or equipment; can be provided if additional equipment (not essential to functioning of the basic machine) simulates the external environment; or can be provided if internal state modification possibilities have been incorporated into the basic machine. Beyond this operation categorization scheme, many factors, called training trade-offs, which must be considered in the allocation of training resources are discussed. (Author)

AD-626 138 Fld. 5/9, 5/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
THE VALIDITY OF THREE TESTS FOR SELECTING NROTC CONTRACT STUDENTS: CSST, SAT, AND NCAT.
Research rept.,
by Edmund D. Thomas, and Patricia J. Thomas.
Dec 65, 15p. Rept. no. srr-66-9
Proj. PF-016050401
Unclassified report

Descriptors: (*Psychometrics, Naval personnel), (*Naval personnel, Selection), Officer personnel, Students, Universities, Aptitude tests

Candidates to the NROTC Contract Program are selected by the Commanding Officer of each university NROTC unit. Scores on tests of scholastic aptitude are often part of the selection evaluation. This study focused on three such tests which were used in the assessment of applicants for the 1963 Contract NROTC: the Contract Student Selection Test (CSST), Forms 3 and 4, the Scholastic Aptitude Test (SAT), and the 1962 Navy College Aptitude Test (NCAT). Validities were determined for each of these predictors using two measures of freshmen academic achievement, Grade Point Average (GPA) and Naval Science Grade (NSG). Total scores on the three tests were found to be almost equally predictive of both criteria, with validities centering around r = .25. However, when the SAT Total score was separated into the two component scores, SAT-V and SAT-M emerged as a significantly better predictor of both GPA (r = .33) and NSG (r = .34). It was recommended that when there are a greater number of applicants than the established quota, those having the highest scores on SAT-V be given preference. When these scores are not available, administration of the CSST was recommended. An equipercentile conversion table was given for transforming scores on the CSST to the SAT-V scale. Because of the annual revision of the NCAT, score distributions and validities fluctuate with each edition, and the use of this test was recommended with reservation. (Author)

AD-626 283 Fld. 5/9, 9/3
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
THE PRACTICAL PLAN OF INSTRUCTION FOR THE 1965 NON-COMMISSIONED OFFICERS ELECTRONICS COURSE AT THE ARMY ENGINEER SCHOOL.
30 Nov 65, 17p. Rept. no. ACSI-I-7833-A
TT 66-60231
Unclassified report

Trans. of an Unidentified Chinese mono., n.p. 1964.

Descriptors: (*Military training, Electronics), (*Electronic technicians, Military training), Maintenance, Guided missiles, Electronic equipment, China

Contents: the goal in instruction, the main points of instruction, the prerequisites for instruction, the periods of instruction, the training of personnel, the distribution of instruction hours, subject examinations by percentage, a guide to the application phase, administration.

AD-626 284 Fld. 5/9, 9/3
CFSTI Prices: HC $3.00 MF $0.75
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
A PRACTICAL PLAN OF INSTRUCTION FOR THE 1965 OFFICERS ELECTRONIC COURSE AT THE ARMY ENGINEER SCHOOL.
30 Nov 65, 60p. Rept. no. ACSI-I-7833-B
TT 66-60232
Unclassified report

Trans. of an unidentified Chinese mono., n.p. 1964.

Descriptors: (*Military training, Electronics), (*Officer personnel, Military training), China

Contents: the goal of instruction, the main points of instruction, the prerequisites for instruction, the periods of instruction, the training of personnel, the distribution of instruction hours, a guide to the application phase, administration.

AD-626 286 Fld. 5/9
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
SHOCK WORKERS OF COMMUNIST LABOR IN THE PRINTING AND PUBLISHING ENTERPRISES OF THE MAIN DIRECTORATE OF GEODESY AND CARTOGRAPHY. (UDARNIKI

KOMMUNISTICHESKOGO TRUDA V POLIGRAFICHESKIKH PREDPRIYATIYAKH GLAVNOGO UPRAVLENIYA GEODEZII I KARTOGRAFII).
by L. P. Egorov. 1965, 6p. Rept. no. ACSI-I-7967
TT 66-60234

Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n10 p3-8 1964.

Descriptors: (*Labor, Communists), Job analysis, Printing, Documentation, Geodesics, Mapping, USSR

AD-626 468 Fld. 5/9
CFSTI Prices: HC $2.00 MF $0.50
NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y
AN EVALUATION OF VARIOUS TACHISTOSCOPIC AND WEFT TECHNIQUES IN AIRCRAFT RECOGNITION.
Final rept.,
by Edward I. Gavurin. Nov 65, 28p. Rept. no. NAVTRADEVCEN-IH-40
Proj. NTDC-7885-1P2

Unclassified report

Descriptors: (*Military training, Analysis), (*Target recognition, Military training), (*Aircraft, Target recognition), Wings, Aircraft engines, Fuselages, Tails (Aircraft), Tachistoscopes, Effectiveness

The study evaluated some of the basic assumptions, techniques and procedures underlying current aircraft recognition training. The effectiveness of the WEFT (analytical) vs. the tachistoscopic approach to training, the relative merits of a successive vs. a simultaneous presentation of stimuli, and the role of image exposure time were investigated. Recommendations for current training and additional research are included. (Author)

AD-626 523 Fld. 5/9
CFSTI Prices: HC $1.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY WASHINGTON D C
SSB (N) WEAPONS SYSTEM PERSONNEL STATISTICS.
Personnel research note.
Sep 64, 7p.
ND 65-8-N

Unclassified report

Descriptors: (*Naval training, Weapon systems), (*Naval personnel, Selection), Statistical data

AD-626 524 Fld. 5/9
CFSTI Prices: HC $1.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY WASHINGTON D C
SSB (N) WEAPONS SYSTEM PERSONNEL STATISTICS.
by W. T. George, and L. M. White. Dec 64, 7p.
ND 65-22-N

Unclassified report

Descriptors: (*Naval training, Weapon systems), (*Naval personnel, Selection), Statistical data

AD-626 526 Fld. 5/9, 17/9, 15/3, 22/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY WASHINGTON D C
MANPOWER AND TRAINING REQUIREMENTS FOR THE U. S. NAVY SPACE SURVEILLANCE SYSTEM HEADQUARTERS, DAHLGREN, VA.
Rept. on Space and Astronautics,
by Elmer P. Borkowski. Jun 65, 78p.
ND 65-64

Unclassified report

Descriptors: (*Military training, Satellite tracking systems), (*Naval personnel, Satellite tracking systems), (*Satellite tracking systems, Manpower studies), (*Space surveillance systems, Manpower studies), Digital computers, Analog computers, Maintenance, Computer personnel, Maintenance personnel

This study was conducted to determine the quantitative and qualitative personnel requirements of Navy personnel assigned to the Headquarters, (NAVSPASUR) in the event of Navy manning at a future date. Recommendations: Selection criteria for machine accountants assigned to the Processing and Evaluation Division should include training and/or experience on high speed digital computers. Due to the level of skill involved and the critical nature of the operation, key personnel should receive an overlapping tour of duty. The selection criteria of maintenance personnel for the Headquarters should include training and/or experience in the maintenance of digital and analog computers. Personnel assigned to operate and maintain the Automatic Digital Data Assembly System must receive on-the-job training as soon as they report for duty. No additional schools or Naval Enlisted Codes will be required to support the U.S. Navy Space Surveillance System.

AD-626 527 Fld. 5/9, 18/3, 22/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY WASHINGTON D C
MANNING AND TRAINING REQUIREMENTS FOR THE U. S. NAVY SPACE SURVEILLANCE SYSTEM FIELD STATIONS.
Rept. on Space and Astronautics,
by Elmer P. Borkowski. Jun 65, 42p.
ND 65-66

Unclassified report

Descriptors: (*Space surveillance systems, Military training), (*Military training, Space surveillance systems), Military requirements, Military personnel, Electronic technicians

The U. S. Navy Space Surveillance System (SPASUR) is designed to detect, identify, and determine the orbits of all satellites passing over the United States. The System is composed of a Headquarters, three transmitting, and four receiving stations. In normal operation, the transmitting stations project vertically a thin continuous-wave, stationary fan-shaped radio beam. Radio reflections from satellites and other objects in orbit are detected by the receiving stations which triangulate on the bodies' positions in space. All data from the receiving stations are transmitted directly to NAVSPASUR Headquarters, where the information is analyzed. Data that have been collected and analyzed are stored in memory units of the computers at NAVSPASUR Headquarters. Incoming data are compared with all other data that are stored in the computer memory. When new satellites are detected the orbits are determined and the computer predicts future orbital information. Orbital information on all new satellites is transmitted to Headquarters, North American Air Defense Command. (Author)

AD-626 612 Fld. 5/9, 5/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
GEOGRAPHICAL DIFFERENCES IN RESPONSES TO A TEST OF VOCATIONAL INTERESTS.
Research rept. Jan 64-Dec 65,
by Richard R. Stephenson. Jan 66, 14p. Rept. no. SRR-66-10
Proj. PF-016070202

Unclassified report

See also AD-620 320.

Descriptors: (*Aptitude tests, Geography), (*Geography, Aptitude tests), (*Officer personnel, Selection), Naval personnel, Psychometrics, Correlation techniques, Analysis

The purpose of this study was to test for geographic response bias in a commercial test of vocational interests, the Strong Vocational Interest Blank (SV1B). The SV1B is being evaluated for possible use in the selection of career oriented officers commissioned through the NROTC (Regular) officer procurement program. To make this geographic evaluation, the continental United States was first divided into six areas following popular notions of geographical stereotypes. A contingency analysis was then performed, analyzing item response differences across geographical areas. Six of the 405 SV1B items yielded significant response biases attributable to geographical area of residence. These items were excluded from further consideration in the construction of a career naval officer 'occupational' scoring key for the SV1B. (Author)

AD-625 854 See Fld. 6/14

AD-625 916 See Fld. 5/1

AD-625 997 See Fld. 5/10

AD-626 087 See Fld. 15/5

AD-626 262 See Fld. 5/7

AD-626 270 See Fld. 8/2

AD-626 271 See Fld. 8/9

AD-626 473 See Fld. 6/5

5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

AD-625 919 Fld. 5/10, 5/5
CFSTI Prices: HC $3.00 MF $0.50
HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA
A STUDY OF THE EFFECTS OF MANIFEST ANXIETY AND SITUATIONAL STRESS ON M-1 RIFLE FIRING.
Staff memo.,
by Joseph C. Hammock, and Albert I. Prince. Oct 54, 58p.

Unclassified report

Descriptors: (*Anxiety, Performance tests), (*Stress (Psychology), Performance tests), (*Rifles, Operation), Explosions, Noise, Analysis of variance, Targets

The problem was to determine the relation of anxiety and stress to marksmanship proficiency, and the relation of anxiety to the effects of stress on marksmanship, soldiers scoring at the extremes of a scale of manifest anxiety were test fired on the M-1 rifle under 'normal' and 'stress' conditions. The firing procedure for normal conditions was substantially the same as in conventional record fire. The stress condition was similar but involved a series of explosions going off successively closer to the firer during firing. False instructions were given which stated that a charge directly in front of the firer's position would be detonated eventually if the firer did not make three bullseyes in the time allotted. (Author)

AD-625 983 Fld. 5/10, 6/4
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THEORIES OF INSTINCTIVE BEHAVIOR AND THEIR COMPUTER ANALOGUES.
Professional paper,
by Leonard Friedman. 10 Dec 65, 47p. Rept. no. SP-2292/000/00

Unclassified report

Descriptors: (*Behavior theory), (*Artificial intelligence, Simulation), Reasoning, Computers, Learning, Nervous system, Physiology, Feedback, Perception, Animals, Synthesis

Theories of instinctive behavior proposed by Lorentz (Physiological mechanisms in animal behaviour. Symp. Soc. Exper. Biol., 1950, v.4, p221-268) and Tinbergen (The study of instinct. Oxford, Clarendon Press, 1951) have been analyzed with respect to longstanding criticisms leveled at them, as well as to neurophysiological evidence. A theory of instinct that meets the criticisms and reconciles the ethological and neurophysiological evidence is proposed. This theory retains the fruitful concept of the Innate Releasing Mechanism (IRM) introduced by Lorenz and unifies the description of instinctive behavior in terms of hierarchies of feedback loops organized as Behavior Units. The Behavior Units are activated by a complex organization of IRM's and Selection Units operating continuously among a host of competing pressures, internal and external, to select the most appropriate action. Various assumptions about the role of learning in instinct-dominated animals are exposed and examples are given of the connection between our assumptions about learning and the modified theory of instinct. To validate the theory and permit its development in greater detail, a computer simulation of the theory has been undertaken, using an artificial animal, ADROIT, as the 'guinea pig'. Progress to date with this simulation is discussed. (Author)

AD-625 997 Fld. 5/10, 5/9
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
NAVY FAMILIES IN DISTRESS.
Final rept.,
by William J. Dickerson, and Ransom J. Arthur.
1964, 9p. Rept. no. CIC-TR-19
Contract Nonr-222 (51) Proj. NR-105-156
Unclassified report

Availability: Published in Military Medicine v130 n9 p894-8 Sep 1965. Copies to DDC users only.

Descriptors: (*Naval personnel, Military psychology), Children, Behavior, Adjustment (Psychology)

The study comprised 56 families who applied to the Child Guidance Clinic, U. S. Naval Hospital, Oakland, California between December 1962 and March 1963. The characteristic family was that of an older career Navy man with over 14 years service who was a senior petty officer or commissioned officer. The mother was categorized as depressed, anergic, and ambivalent, and marital instability was prominent. The patients were most often the eldest sons with long-standing problems, mostly behavioral. The parents often blamed themselves or others for the difficulties but not the child. Despite frequent moves and paternal absences, few parents wished to leave the Navy. They hoped the clinic would directly change the child and explicitly guide them in child rearing. (Author)

AD-626 109 Fld. 5/10
DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
VISUAL-KINESTHETIC LOCALIZATION,
by A. V. Churchill. 10 Sep 64, 4p. Rept. no. DRML-RP-572
Proj. D77-94-20-23
Unclassified report

Availability: Published in The American Journal of Psychology vLXXVIII p496-8 Sep 1965. Copies to DDC users only.

Descriptors: (*Positioning reactions, Performance (Human)), Vision, Hands, Errors, Performance tests, Analysis of variance, Canada

The results of this study partly confirm the original observation, and further suggest that there is little difference in the accuracy with which Ss perform under the two experimental conditions, the main difference being in the directional bias of the error (mean CE -2.10 degrees under Condition 1, and Mean CE +2.00 degrees under Condition 2). The results suggest, also, that with righthanded Ss, performance is more accurate with the right hand (over-all ME 2.16 degrees), than with the left hand (over-all ME 4.37 degrees). (Author)

AD-626 112 Fld. 5/10
DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
THE RELATION BETWEEN THE VISUAL IMAGE AND POST-PERCEPTUAL IMMEDIATE MEMORY,
by Jane F. Mackworth. 1 Mar 63, 11p. Proj. PCC-D77-94-20-46
Unclassified report

Availability: Published in Journal of Verbal Learning and Verbal Behavior, v2 n1 p75-85 Jul 1963. Copies to DDC users only.

Descriptors: (*Visual perception, Memory), (*Memory, Visual perception), Vision, Recall, Reading, Psychometrics, Correlation techniques, Canada

The experiments investigated the relations between immediate recall of visually presented digits, letters, colors, and shapes and various methods of presentation, in order to illustrate the use of a simple equation which gave a quantitative analysis of the factors involved. This analysis was based on the assumption that the whole of the recall task involved a constant amount of a quantity called the A-factor. Experiment I compared Single and Block presentation at three speeds (0.25 to 1 sec./item); Experiment II studied Single presentation at slower speeds (1 to 2 sec./item) with shorter messages. Experiment III studied Block presentation at exposures from 0.1 to 6 sec. Eight Ss, housewives, were used for each experiment. The speed of reading the materials was measured. There was a positive correlation for each S between the various measures. Experiment IV examined the effect of message length up to 20 letters upon the recall of letters. The Ss were 12 school giiirls. The relation between message length and recall could be regarded as a rapid loss of most of the message, followed by a slow loss of the last few items. A linear equation seemed to be a reasonable fit for the first part of the curve. This was $Ma + Ns = 100$, where M = number of items given, and N = number of items recalled. Experiment V examined the effect of message length upon recall of the four materials. The Ss were ten schoolgirls. The recall loss due to excess material was approximately linear and parallel for the four materials. (Author)

AD-626 128 Fld. 5/10
GEORGIA UNIV ATHENS
EFFECTS OF TIME FACTORS IN PAIREDASSOCIATE VERBAL LEARNING,
by Blaine L. Baker, and Clyde E. Noble. 11 Jun 64, 9p.
Unclassified report

Availability: Published in Journal of Verbal Learning and Verbal Behavior v4 n5 p437-45 Oct 1965. Copies to DDC users only.

Descriptors: (*Learning, Word association), (*Word association, Learning), (*Verbal behavior, Learning), Psychometrics, Test construction (Psychology), Time, Statistical analysis

AD-626 305 Fld. 5/10
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
DISCRIMINABILITY AND SCALING OF LINEAR EXTENT,
by C. Douglas Creelman. 5 May 64, 11p. Rept. no. 4
Contract Nonr-248 (55) ,Nonr-4010 (03)
Unclassified report

Prepared in cooperation with Toronto Univ., (Ontario)

Availability: Published in Journal of Experimental Psychology, v70 n2 p192-200 Aug 1965. Copies to DDC users only.

Descriptors: (*Visual perception, Geometric forms), Rectangular bodies, Linear systems, Measurement, Performance (Human), Decision making, Visual acuity, Signals, Stimulation, Canada

Discrimination between lengths of printed lines was measured by 4 operationally different experimental techniques. 3 of the techniques (single stimuli, absolute judgment, and a modification of the method of constant stimuli) yielded psychophysical scales which were consistent with each other and with the theory of signal dectectability (TSD). In the 4th experimental procedure stimuli had unequal a priori probabilities. This produced consistently higher measures of discrimination. A possible explanation for this obtained discrepancy is the lack of long-term learning under this task as opposed to the others. The results extend the applicability of TSD to some further judgment tasks and experimental conditions. (Author)

AD-626 306 Fld. 5/10
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
DISCRIMINABILITY AND PREFERENCE FOR ATTRIBUTES IN FREE AND CONSTRAINED CLASSIFICATION,
by Shiro Imai, and W. R. Garner. 23 Mar 64, 14p. Rept. no. 6
Contract Nonr-248 (55) ,Nonr-4010 (03)
Unclassified report

Availability: Published in Journal of Experimental Psychology, v69 n6 p596-608 Jun 1965. Copies to DDC users only.

Descriptors: (*Classification, Psychometrics), (*Psychometrics, Classification), (*Visual perception, Geometric forms), Performance (Human), Identification

Two experiments on classification were carried out with stimuli consisting of a pair of dots which could vary in Position, Distance between dots, and Orientation of the dots. In free classification, stimulus sets are presented to S, who dichotomously classifies according to any attribute he chooses. In this task choices are affected by individual preferences for attributes as well as by discriminability of the attribute chosen and discriminability of competing attributes. In constrained classification, S is required to sort stimulus sets according to the attribute specified by E, and speed of sorting is measured. In this task, only discriminability of the criterion attribute affects performance. (Author)

AD-626 309 Fld. 5/10
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
FORM AND AMOUNT OF INTERNAL STRUCTURE AS FACTORS IN FREE-RECALL LEARNING OF NONSENSE WORDS,
by W. R. Garner, and James R. Whitman. 22 Jun 64, 11p. Rept. no. 7
Contract Nonr-248 (55) ,Nonr-4010 (03)
Unclassified report

Prepared in cooperation with Veterans Administration Hospital, American Lake, Washington.

Availability: Published in Journal of Verbal Learning and Verbal Behavior, v4 n4 p257-66 Aug 1965. Copies to DDC users only.

Descriptors: (*Learning, Recall), (*Word association, Learning), Verbal behavior, Psychometrics

A series of free-recall learning experiments was carried out with visually presented nonsense words as stimuli, generated by using four letter words with two alternative letters per letter posi-

tion. Five different groups of Ss were presented with a total of 17 different learning problems involving variations in size of set of stimuli to be learned and in the internal structure of subsets of stimuli. The results are analyzed in the light of several problems in the psychology of learning: (1) Internal structure with simple contingencies between pairs of variables making up the stimuli provides relatively easy learning, while internal structure with no pair contingencies provides very difficult learning. (2) Learning difficulty is maximum as a function of length of list when the list is a subset of the total set, thus requiring learning of internal structure. The easiest-to-learn subsets of eight are as difficult to learn as the total set of 16 words. (3) Positive transfer or facilitation occurs if a subset is learned prior to learning of a total set, but not conversely; or when an easy subset of eight is learned prior to learning the complement of that set. (4) There is no difference between whole learning and part learning of either the total set or a subset as long as only easy-to-learn subsets are used as either parts or as wholes. Use of a difficult subset makes part learning of the total set ineffective. (Author)

AD-626 313 Fld. 5/10, 20/6
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
COLOR NAMES FOR COLOR SPACE,
by Alphonse Chapanis. 1965, 19p. Contract Nonr-4010 (03) ,Nonr-248 (55)
Unclassified report

Availability: Published in American Scientist v53 n3 p327-46 Sep 1965. Copies to DDC users only.

Descriptors: (*Colors, Perception (Psychology)), Analysis, Physical properties, Vocabulary, Identification, Optical properties

A theoretical estimation of between 52 and 55 usable color names was made for all of color space.

AD-626 367 Fld. 5/10, 5/6
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
WHAT'S IN THE BRAIN THAT INK MAY CHARACTER,
by Warren S. McCulloch. 1965, 10p. Contract DA-36-039-AMC-03200 (E) ,AF33 (615)-1747
Unclassified report

Availability: Published in Reprint. Copies to DDC users only.

Descriptors: (*Psychology, Theory), (*Reasoning, Theory), Mathematical logic, Brain, Bionics, Cybernetics, Probability

AD-626 531 Fld. 5/10, 12/1, 9/4
CFSTI Prices: HC $1.00 MF $0.50
ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB
A NOTE ON THE CONCEPT OF UNCERTAINTY AS APPLIED IN PSYCHOLOGICAL RESEARCH.
Technical documentary rept.,
by Raymond S. Nickerson. Oct 65, 14p. Proj. 7682 Task 768201
ESD TR-65-222
Unclassified report

Descriptors: (*Uncertainty, Analysis of variance), Psychology, Information theory, Probability

The report distinguishes four different connotations of 'uncertainty' as the term has been used in the psychological literature. (Author)

AD-626 570 Fld. 5/10
MARYLAND UNIV COLLEGE PARK DEPT OF PSYCHOLOGY
A TEST OF THE SELECTIVE-EXPOSURE HYPOTHESIS IN PERSUASION.
Technical rept.,
by Elliott McGinnies, and Leonard L. Rosenbaum. 24 Oct 65, 6p. Rept. no. TR-8
Contract Nonr-595 (21) Proj. NR-171-250
Unclassified report

Availability: Published in The Journal of Psychology v61 p237-40 1965. Copies to DDC users only.

Descriptors: (*Attitudes, Social psychology), (*Social communication, Effectiveness), Males, Females, Psychometrics

The attitudes of 101 students were measured on the subject of American involvement in Vietnam prior to a televised address on this subject by President Johnson on April 7, 1965. The male respondents supported the position advocated by the President more strongly than the female respondents, and proportionately more of the males were subsequently exposed either directly or indirectly to the President's talk. Comparison of the attitude scores of those students who attended either directly or indirectly to the talk with those who did not revealed a selective exposure effect operating with the females but not with the males. That is, those females who were more favorable toward the position advocated were more inclined to listen. This finding was attributed to the greater spread of attitudes among the females, which permitted selective exposure to take place. (Author)

AD-626 590 Fld. 5/10, 5/11
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES DEPT OF PSYCHOLOGY
DYNAMICS OF SOCIAL INFLUENCE.
Annual rept. no. 7, Nov 64-Nov 65,
by Bertram H. Raven. Nov 65, 13p. Contract Nonr-233 (54) Proj. NR-171-350
Unclassified report

See also AD-609 110.

Descriptors: (*Social psychology, Attitudes), (*Attitudes, Social psychology), Group dynamics, Behavior, Performance (Human), Social communication, Bibliographies, Males, Females, Performance tests, Sociometrics, Psychometrics

The report relates activity in the following: Bibliography of small group research; power relations in on-going groups; social influence in interdependent situations; prior behavior and belief as a reference for self-evaluation and performance.

AD-626 614 Fld. 5/10, 6/19
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
SENSITIVITY OF THE VISUAL SYSTEM TO CHANGES IN THE RATE OF INTERMITTENCE,
by J. W. Gebhard, and G. H. Mowbray. 10 Mar 58, 31p. Rept. no. TG-303
Contract NOrd-7386
Unclassified report

Descriptors: (*Thresholds (Physiology), Vision), (*Vision, Thresholds (Physiology)), Touch, Hearing, Sensitivity

Experimentation is reported that concerned the relative judgment of frequency of visual flicker. This was the result of investigation into the number of absolutely identifiable steps, difference-limens, or 'just noticeable differences' in such visual scales as size, brightness, hue, or flicker, all being part of the desire to assess the usefulness of visual stimuli for coding information in an electronic data display system. Data were obtained from 3 kinds of photic experiments: frequency matching of 2 pulse trains by the method of adjustment, the method of single stimuli, and perceiving a gap in a pulse train. Determinations were also made of difference-limens for the rate of intermittent electrical phosphenes and for rate discrimination in audition and touch.

AD-625 759 See Fld. 6/16

AD-625 837 See Fld. 6/18

AD-625 909 See Fld. 6/16

AD-625 961 See Fld. 6/15

AD-625 995 See Fld. 6/15

AD-626 012 See Fld. 6/16

AD-626 117 See Fld. 6/16

AD-626 119 See Fld. 6/5

AD-626 138 See Fld. 5/9

AD-626 290 See Fld. 12/1

AD-626 292 See Fld. 6/3

AD-626 436 See Fld. 6/16

AD-626 473 See Fld. 6/5

AD-626 507 See Fld. 6/5

AD-626 546 See Fld. 5/11

AD-626 612 See Fld. 5/9

AD-626 638 See Fld. 5/5

5/11. SOCIOLOGY

AD-626 546 Fld. 5/11, 5/10
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
ACCULTURATION, SELF-IDENTIFICATION, AND PERSONALITY ADJUSTMENT,
by Norman A. Chance. 1965, 25p. Contract Nonr-3996 (01) Proj. NR-307-105
Unclassified report

Availability: Published in American Anthropologist v67 n2 p372-93 Apr 1965. Copies to DDC users only.

Descriptors: (*Anthropology, Alaska), (*Culture, Alaska), Personality, Adjustment (Psychology), Behavior, Group dynamics, Social psychology, Males, Females, Sociology, Statistical analysis

AD-626 590 See Fld. 5/10

6/1. BIOCHEMISTRY

AD-625 843 Fld. 6/1, 6/16
CFSTI Prices: HC $1.00 MF $0.50
HOKKAIDO UNIV SAPPORO (JAPAN) SCHOOL OF MEDICINE
ROLE OF THE NEUROHYPOPHYSIAL HORMONE IN THE SECRETION OF ANTERIOR PITUITARY HORMONE.
Semiannual rept. 15 May-14 Nov 64,
by Shinji Itoh. 14 Nov 64, 4p. Contract DA-92-557-FEC-37351
ARDG (FE) J-200
Unclassified report

Descriptors: (*Pituitary hormones, Secretion), Thyroid gland, Electrolytes (Physiology), Salts, Body temperature, Oxygen consumption, Thalamus, Inhibition, Adrenocorticotropic hormone, Emotions, Epinephrine, Lipids, Metabolism, Stress (Physiology), Fats, Exposure, Phosphoric monoester hydrolases, Thyroxine, Japan

Extensive investigations are now being conducted on the possibility that the neurosecretory process is involved in the hypothalamic control upon the adenohypophysical secretion. Studies on the neu-

rohypophysial hormones in relation to the secretion of growth hormone, prolactin, thyrotophin, and corticotrophin have been conducted for many years. Recent study on the effect of vasopressin on the thyroid activity elucidated some evidences that the hormone, if given relatively small amount under certain experimental condition, acts on the thyroid inhibitory, and if given large amount, it stimulates the thyroid secretion directly. It was also shown that the neurohypophysis plays an important role in the secretion of ACTH, that is, in neurohypophysectomized rats the secretion of ACTH due to emotional stress and epinephrine is inhibited. The purpose of this investigation is to clarify the role of the neurohypophysial hormone and neurosecretory materials in the adenohypophysial activity. (Author)

AD-625 848 Fld. 6/1, 6/5
CFSTI Prices: HC $1.00 MF $0.50
KUMAMOTO UNIV (JAPAN) MEDICAL SCHOOL
BIOLOGICAL SIGNIFICANCE OF A PROTEASE INHIBITOR, NEWLY ISOLATED FROM ANIMAL TISSUES, IN INFLAMMATION.
Semiannual rept. for 1 Jun-30 Nov 64,
by Hideo Hayashi. 30 Nov 64, 5p. Contract DA-92-557-FEC-37370
ARDG (FE) J-196

Unclassified report

See also AD-624 889.

Descriptors: (*Peptide hydrolases, Inhibition), (*Enzyme inhibitors, Healing), Tissues (Biology), Nucleic acids, Electrophoresis, Histamiine, Antigen-antibody reactions, Tissue culture, Skin, Permeability, Pathology, Rabbits, Japan

The present work confirms further physiocochemical properties of a specific protease inhibitor: Its molecular weight is 12,500 = 700 when estimated by the method of Archibald. The isoelectric point of this inhibitor is around 6.6 and its sedimentation coefficient is 1.21S. It gives faint reaction in the biuret test. The substance shows maximal absorbancy at 276 millimicrons and its ratio of absorbancies of 276 and 260 millimicrons is 1.61, showing that it is free of nucleic acid. The inhibitor increases with development of Arthus inflammation, particularly after peak of proteolytic activity of the lesion (its peak corresponds to the maximal height of the lesion). Accordingly, the decrease in the protease activity, appearing with development of healing of the lesion, is due to local increase of this inhibitor. The inhibitor forms the complexes with the Arthus protease resulting in its inactivation, but the complexes are present in an easily dissociable state in the healing skin site.

AD-625 955 Fld. 6/1, 6/5
CFSTI Prices: HC $1.00 MF $0.50
KEIO UNIV TOKYO (JAPAN) SCHOOL OF MEDICINE
HISTOCHEMICAL STUDIES ON THE DISTRIBUTION OF ENZYMES, ESPECIALLY OXIDASES AND PHOSPHATASES IN THE LIVING BODY.
Semi-annual rept. 29 Jul 64-28 Jan 65,
by Tadao Mitsui. 28 Jan 65, 7p. Contract DA-CRD-AG-S92-544-64-G23
ARDG (FE) J-209

Unclassified report

Descriptors: (*Enzymes, Histological techniques) (*Histological techniques, Enzymes), Oxidoreductases, Phosphoric monoester hydrolases, Blood cells, Biological stains, Granules, Reticulo-endothelial system, Phagocytes, Cytochemistry, Amphibians, Japan

Two giant salamanders, Megalobatrachus japonicus were used for materials. The blood was carefully taken from the tail and smear preparations were obtained. The blood smears were fixed one minute with ethanolformol (9:1) solution prior to staining, washed thoroughly in distilled water, and stained five minutes with either of the following peroxidase reagents freshly prepared each time. (1) Mixture of benzidine 0.3 gr., 3% H2O2 10 drops, and distilled water 100 cc. This mixture should be filtered because of poor solubility of benzidine in water. (2) Mixture of orthophenylenediamine 0.1 gr., 3% H2O2 10 drops, and distilled water 100 cc. The smears were then washed in water, and counterstained with dilute Giemsastain for ten to fifteen minutes. Finally they were washed in water, and exposed to air till dry. The alkaline phosphatase technic (modified technic of the leadsulphide method of Takeuchi) was also applied for blood staining. (Author)

AD-626 004 Fld. 6/1, 6/5
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MICROBIOLOGY
CATALYSIS OF C'2 FIXATION BY C'1A. REACTION KINETICS, COMPETITIVE INHIBITION BY TAME, AND TRANSFERASE E HYPOTHESIS OF THE ENZYMATIC ACTION OF C'1A ON C'2, ONE OF ITS NATURAL SUBSTRATES.
by Robert M. Stroud, K. Frank Austen, and Manfred M. Mayer. 28 Dec 64, 16p. Contract Nonr-248 (60) Grant ,NSF-G-19372 Proj. NR-108-104

Unclassified report

Availability: Published in Immunochemistry v2 p219-34 1965. Copies to DDC users only.

Descriptors: (*Complement, Catalysis), (*Enzymes, Complement), Reaction kinetics, Inhibition, Antigens + antibodies, Transferases, Theory, Immunology

In studies of the initial velocity (v) of SAC'1a,4,2a formation it was found that the fixation of C'2 to SAC'1a,4 is catalyzed by C'1a in a manner which follows the classical pattern of enzyme kinetics and which indicates that C'2 is a natural substrate of C'1-esterase. Thus, at constant EAC'1a, 4,1/v varies linearly with 1/C'2 (Lineweave-Burk plot). At constant EAC'4 and C'2, v varies in direct proportionality with C'1a (enzyme) concentration. At constant C'1a and C'2, v increases with the amount of C'4 but the relationship is not linear. Over the range from 5 to 37C, v increases with temperature. TAMe inhibits the formation of SAC'1a,4,2a by competing with C'2 for the active site on the enzyme as indicated by a change of slope, but no change of intercept, in the Lineweaver-Burk plots. Furthermore, TAMe inhibits destruction of C'2 by C'1a in the fluid phase. On the basis of these results, as well as confirmatory observations on the blocking of C'1a by DFP, a transferase hypothesis is proposed to explain the fixation of C'2 on SAC'4 by enzymatic action of C'1a. In essence, it is suggested that C'1a exposes a reactive group on C'2, which can either react with a receptor on C'4 resulting in fixation, i.e. formation of SAC'4,2a, or with water, leading to inactivation. (Author)

AD-626 051 Fld. 6/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
BIOSYNTHESIS OF VITAMIN B12 IN METHANE FERMENTATION,
by L. G. Maslova. Dec 65, 8p. Rept. no. FSTC-381-T65-618
TT 66-60180

Unclassified report

Trans. of Pishchevaya Tekhnologiya (USSR) n4 (47) p79-81 1965.

Descriptors: (*Biosynthesis, Vitamin B complex), (*Vitamin B complex, Biosynthesis), Hydrocarbons, Culture media, Potatoes, Starches, Waste gases, USSR

Vitamin B12 was produced from potato starch production by-products. The fermentation was carried out on potato cell liquor and pulp under thermophilic conditions (56-58C) with a culture of methane producing bacteria, first adapted by by-products of the potato starch industry.

A-626 307 Fld. 6/1
CFSTI Prices: HC $1.00 MF $0.50
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
NITROGEN PARTITION OF THE PLASMA IN NORMAL AND UREMIC SUBJECTS.
Technical rept.,
by Paul D. Doolan, George B. Theil, and Edward L. Alpen. Jan 66, 10p. Rept. no. CIC-TR-20
Contract Nonr-222 (51) Proj. NR-105-156
NAVMED MR005.12-1700.4

Unclassified report

Descriptors: (*Blood diseases, Nitrogen), (*Nitrogen, Blood diseases), Urinary system, Metabolism, Blood chemistry, Blood plasma, Blood serum, Test methods

Plasma and serum from normal and uremic subjects were fractionated into the component nitrogen fraction and this value compared to the nonprotein nitrogen determination. The unaccounted for nitrogen fraction this observed did not correlate in any way to the syndrome of uremia. (Author)

AD-626 310 Fld. 6/1, 6/16
CFSTI Prices: HC $1.00 MF $0.50
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
COMPARATIVE STUDY OF COLLAGEN AND ELASTIN IN VARIOUS ANIMAL AND HUMAN LUNGS.
Final rept.,
by R. Thomas McLaughlin. Jan 66, 5p. Rept. no. CIC-TR-22
Contract Nonr-222 (51) Proj. NR-105-156
NAVMED MR005-12-1200-7

Unclassified report

Descriptors: (*Collagen, Lungs), (*Albuminoids, Lungs), Connective tissue, Mammals, Tissues (Biology), Animals, Humans

Lung tissues of 8 mammalian species, including man, were assayed for collagen and elastin content. Four distinct groups were found with respect to total collagen content; 2 distinct groups with reference to the elastin content. Collagen/elastin ratios are reported. Anatomical and biochemical studies on this subject are compared and no close correlation was demonstrated. (Author)

AD-626 396 Fld. 6/1, 7/3
DUKE UNIV DURHAM N C DEPT OF PHYSICS
FREE RADICALS FORMED BY HYDROGEN ATOM BOMBARDMENT OF THE NUCLEIC-ACID BASES,
by Janko N. Herak, and Walter Gordy. 23 Sep 65, 6p. Contract DA-ARO (D)-31-124-G428

AROD 4131:11

Unclassified report

Availability: Published in Proceedings of the National Academy of Sciences v54 n5 p1287-92 Nov 1965. Copies to DDC users only.

Descriptors: (*Free radicals, Electron spin resonance), (*Pyrimidines, Free radicals), (*Purines, Free radicals), Molecular beams, Hydrogen, Nucleic acids, Chemical reactions, Adenine, Guanine, Deuterium, Bases (Chemistry)

The study provides objective proof that free hydrogen atoms combine directly at room temperature with ring carbons not only of thymine but also of uracil and of the purine bases adenine and guanine. In contrast, no corresponding evidence could be found for H-addition on the ring carbons of cytosine. These results are in agreement with work in progress in this laboratory which shows that the electron spin resonance (ESR) patterns of irradiated single crystals of cytidine do not resembel those expected for free radicals formed by such Haddition on C (6) or C (5). (Author)

AD-626 470 Fld. 6/1, 2/1, 7/3
CALIFORNIA UNIV DAVIS DEPT OF AGRONOMY
THE STRUCTURE OF ABSCISIN II.
Revised ed.,
by K. Ohkuma, F. T. Addicott, O. E. Smith, and W. E. Thiessen. 3 Jun 65, 8p.
Unclassified report

Revision of manuscript submitted 8 Mar 65.

Availability: Published in Tetrahedron Letters No. 29 p2529-35 1965. Copies to DDC users only.

Descriptors: (*Plant hormones (Growth substances), Molecular structure), (*Defoliants, Molecular structure), Cotton, Tissue extracts, Mass spectrum, Spectra (Visible + ultraviolet), Spectra (Infrared), Nuclear magnetic resonance

AD-626 559 Fld. 6/1, 6/3, 6/5
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
RELATION BETWEEN GM (F) AND THE STRUCTURE OF THE GAMMA-GLOBULIN MOLECULE,
by E. R. Gold, W. J. Mandy, and H. H. Fudenberg. 1965, 4p. Contract Nonr-3656 (12) Grant, PHS-HE-05997
Unclassified report

Availability: Published in Nature v207 n5001 p1099-101 Sep 4 1965. Copies to DDC users only.

Descriptors: Antigens + antibodies, Blood chemistry), (*Gamma globulin, Molecular structure), (*Genetics, Antigens + antibodies), Proteins, Molecular properties

AD-626 562 Fld. 6/1, 6/5
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
DEFECTIVE RNA SYNTHESIS IN LYMPHOCYTES FROM PATIENTS WITH PRIMARY AGAMMAGLOBULINEMIA,
by M. J. Cline, and H. Hugh Fudenberg. 30 Sep 65, 2p. Contract Nonr-3656 (12) Grant ,PHS-CA-07723
Unclassified report

Availability: Published in Science v150 n3701 p1311-2 3 Dec 1965. Copies to DDC users only.

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Lymphocytes, Ribonucleic acids), (*Deficiency diseases, Gamma globulin), Clostridium tetani, Vaccines, Labelled substances, Nucleosides, Antigens + antibodies, Agglutinins

Addition of tetanus toxoid to sensitized lymphocytes from normal subjects and patients with 'secondary' acquired agammaglobulinemia resulted in an increased incorporation of tritiated uridine into RNA and this increase was sustained for 48 to 72 hours in vitro. In contrast, the quantity of H3-uridine incorporated into the RNA of lymphocytes from patients with 'primary' acquired agammaglobulinemia decreased after 48 hours of exposure to specific antigen. Lymphocytes from patients with primary agammaglobulinemia were also distinguished by their subnormal and poorly sustained response to phytohemagglutinin and to rabbit antiserum to lymphocytes. These data suggest that the defect in primary agammaglobulinemia involves, either as a primary phenomenon or as a secondary event, an abnormality of quantitative RNA synthesis or of RNA stability in the circulating lymphocyte. (Author)

AD-626 573 Fld. 6/1, 7/3
STATE UNIV OF NEW YORK BUFFALO
AN EMPIRICAL FORMULA FOR CALCULATING MOLECULAR WEIGHTS OF PROTEINS,
by M. Z. Atassi, and S. K. Gandhi. 9 Feb 65, 2p. Contract Nonr-4564 (00) Grant ,PHS-AM-08804-01
Unclassified report

Availability: Published in Naturwissenschaften v52 n10 1965. Copies to DDC users only.

Descriptors: (*Proteins, Molecular weight), (*Molecular weight, Proteins), Equations, Molecular properties

It is shown that the molecular weight of globular proteins may be calculated from the formulas: S0 = 1.62 + (0.00004170)M, where M>40,000; S0 = 0.68 + (0.00007416)M, where M<30,000.

AD-625 849 **See Fld. 6/16**

AD-625 941 **See Fld. 6/15**

AD-625 986 **See Fld. 8/1**

AD-626 040 **See Fld. 6/3**

AD-626 115 **See Fld. 6/13**

AD-626 116 **See Fld. 7/5**

AD-626 370 **See Fld. 6/3**

AD-626 493 **See Fld. 6/5**

6/3. BIOLOGY

AD-625 707 Fld. 6/3
UNIVERSITY COLL LONDON (ENGLAND) DEPT OF ANATOMY
THE DIAMETERS OF THE FIBRES OF THE PERIPHERAL NERVES OF OCTOPUS.
Revised ed.,
by J. Z. Young. 1 Jul 64, 36p. Contract AF-EOAR-2-63
AFOSR 65-1788
Unclassified report

Revision of manuscript submitted 29 Apr 64.

Availability: Published in Proceedings of the Royal Society B v162 p47-79 1965. Copies to DDC users only.

Descriptors: (*Cephalopoda, Peripheral nervous systems), (*Peripheral nervous system, Nerve fibers), (*Nerve fibers, Physical properties), Great Britain, Muscles, Nerves

The diameters and numbers of fibres have been measured throughout the peripheral nervous system. The nerves of the muscles that act upon the outside world contain few fibres, having very large medium-sized fibres but no very small ones. Thus the muscles of the head receive 6000 fibres, the largest of micrometers diameter. The eye muscles receive 3300 fibres, reaching 24 micrometers. The stellar nerve fibres are more numerous (150000), but smaller (< 20 micrometers). The preganglionic fibres joining the c.n.s. to the stellate ganglia are fewer than the postganglionic ones (4000, < 16 micrometers). The fibres to the chromatophores are numerous (30000) and of medium diameter (< 12 micrometers). The visceral motor and vasomotor nerves, however, contain hundreds of thousands of minute fibres (< 3 micrometers). The significance of these numerous small fibres can hardly be to obtain great resolution of movement in such acts as secretion of saliva. Presumably the great number has a special significance. The fibres to the muscles of the buccal mass are more numerous and smaller than the somatic motor fibres, but fewer and larger than those for the viscera. The muscles of the arms and suckers have 3000000 fibres, all < 6 micrometers, originating from neurons within the arms. (Author)

AD-625 726 Fld. 6/3
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES DEPT OF ZOOLOGY
MECHANISM OF UTILIZATION OF CARBON SOURCES BY FLAGELLATED PROTOZOA.
Final rept.,
by Blaine H. Levedahl. 1965, 2p. Contract Nonr-233 (95) Proj. NR-108-673
Unclassified report

Descriptors: (*Succinates, Protozoa), (*Protozoa, Succinates), Antimetabolites, Transport properties, Carbon, Carbon dioxide, Labeled substances, Enzymes, Metabolism

The transport of succinate into Euglena gracilis var bacillaris (streptomycin bleached) was investigated with the use of structural analogs and metabolic inhibitors. The study showed a transport system different than that used for acetate. The transport system is judged to be a stereo-specific site requiring two carboxyl groups in a cis position separated by no more than three carbon atoms and two intact hydrogen atoms in the carbon position. Studies were begun on identification of the first products formed after succinate uptake. Coupled with this work was the finding that Euglena fixes rather large amounts of C02 heterotrophically when succinate is used as a carbon source but not, apparently, when acetate is the sole carbon source. Results of experiments using labeled succinate and non-labeled C02 when compared with those using labeled C02 and non-labeled succinate, indicate that C02 may be intimately connected with succinate utilization by Euglena. With the finding of significant heterotrophic C02 fixation by Euglena (bleached), a study was undertaken to find an effective method for sub-cellular fractionation of Euglena to permit study of the enzyme systems involved in the fixation process. (Author)

AD-626 015 Fld. 6/3, 6/16
NATIONAL JEWISH HOSPITAL DENVER COLO
THE ROLE OF ENVIRONMENT AND ENDOCRINES IN THE IMMUNE RESPONSE,
by Ignatius L. Trapani. 1964, 1p. Contract Nonr-3545 (00)
Unclassified report

Availability: Published in Abstracts of Papers presented at XXIII Internationa Congress of Physiological Sciences. Copies to DDC users only.

Descriptors: (*Environment, Immunity), (*Endrocrine glands, Immunity), Adaptation (Physiology), Temperature, Thyroid gland, Adrenal glands, Thymus, High altitude, Thyroxine, Antigens + antibodies, Synthesis, Hormones, Abstracts

The complexity of the relationship of environmental exposure and endocrine function to the immune response has been studied. Even though certain physiological changes might be implicated a priori, it is difficult to attribute the net immune response to only one factor. In general, the net immune response is decreased in animals adapted to low environmental temperature, thyroidectomized, adrenalectomized or thymectomized; and increased in animals adapted to high altitude or treated with thyroxin. However, the net immune response is the resultant of two processes, antibody production and antibody decay, occurring simultaneously but not necessarily at the same rate. Furthermore, antibody synthesis and antibody turnover may not be affected in the same direction by the environmental or hormonal alteration imposed upon the host. For these reasons, it appears essential to consider the immunophysiological interrelationships and the response of the animal as an integrated unit. Thus it will eventually be possible to obtain a clearer understanding of the role of environment and endocrines in the hostparasite relationship. (Document quoted in its entirety.)

AD-626 018 Fld. 6/3
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF STATISTICS
THE DISTRIBUTION OF ORGANISMS,
by Geoffrey S. Watson. 1964, 8p. Contract Nonr-4010 (09)
Unclassified report

Availability: Published in Biometrics v21 n3 p543-50 Sep 1965. Copies to DDC users only.

Descriptors: (*Animals, Distribution), Biometry, Environment, Mobility, Mathematical models, Probability, Population (Mathematics)

AD-626 024 Fld. 6/3, 9/5
GENERAL DYNAMICS/ELECTRONICS ROCHESTER N Y
INFORMATION PROCESSING BY ELECTRIC FISHES,
by Eugene Agalides, Jorge Bernardini, and Roland Zinsmeister. 1963, 26p. Contract Nonr-3993 (00)

Unclassified report

Availability: Published in Paper presented at the 1964 Rochester Conference on Data Acquisition and Processing in Biology and Medicine p221-45 Jul 1964. Copies to DDC users only.

Descriptors: (*Fishes, Electric discharges), (*Information theory, Fishes), Electric fields

AD-626 037 Fld. 6/3, 6/20
ILLINOIS UNIV URBANA DEPT OF PHYSIOLOGY AND BIOPHYSICS
PHYSIOLOGICAL ACTIVITY OF THE ICHTHYOTOXIN FROM PRYMNESIUM PARVUM,
by I. Parnas, and Bernard C. Abbott. 7 May 65, 14p. Contract Nonr-3985 (02)

Unclassified report

Availability: Published in Toxicon, v3 p133-45 1965. Copies to DDC users only.

Descriptors: (*Algae, Toxins + antitoxins), (*Skeletal muscle relaxants, Marine biology), Toxicity, Fishes, Amphibians, Crustacea, Nerves, Muscles, Neuromuscular transmission, Atropine, Morphine, Acetylcholine, Tissues (Biology)

The toxin of Prymnesium parvum (Chrysophyceae) blocks neuromuscular transmission in the frog sartorius preparation, while nerve and muscle remain directly excitable. The toxin acts as a nondepolarizing blocking agent on the postynaptic membrane of the endplate. In crayfish and lobster deep abdominal extensors, neuromuscular transmission is also blocked at a toxin concentration of 0.5 gamma/ml. A dual effect is observed on the ventricular action potential, namely depolarization and shortening of the action potential plateau. Since atropine and morphine counteract the shortening of the action potential plateau this effect is probably caused by the release of ACh from the vagus. (Author)

AD-626 040 Fld. 6/3, 6/1
ATLANTIC REGIONAL LAB HALIFAX (NOVA SCOTIA)
EFFECTS OF CARBOXYLIC ACIDS ON GROWTH AND PHOTOSYNTHESIS OF HAEMATOCOCCUS PLUVIALIS,
by J. McLachlan, and J. S. Craigie. 8 Jul 65, 8p. NRC 8634

Unclassified report

Availability: Published in Canadian Journal of Botany, v43 p1449-56 1965. Copies to DDC users only.

Descriptors: (*Algae, Metabolism), (*Carboxylic acids, Algae), (*Growth, Carboxylic acids), (*Photosynthesis, Carboxylic acids), Growth substances, Antimetabolites, Glyoxylic acid, Succinates, Malonic acids, Acetic acids, Amino acids, Amides

The effects of a number of carboxylic acids on growth of Haematococcus pluvialis were examined at pH 5.0 and 7.5. The rate of growth at pH 5.0 was less than at pH 7.5. Of the acids examined, only glycolic and glyoxylic acids stimulated growth. A number of these acids were inhibitory, and in most cases this was more marked under acidic conditions. Malonic acid, at a concentration of 5 mM, had little effect on growth at either pH 5.0 or 7.5. The rate of photosynthesis was depressed at pH 5.0 compared with the rate at pH 7.5, but more so in the presence of malonic than succinic acid. None of the carboxylic acids examined served as a source of carbon for heterotrophic growth in the dark. Acetate and glyoclate did, however, serve as a source of carbon for growth in the light under carbon dioxide free conditions. Glycolate was effective at both pH 7.5 and 5.0, but acetate was toxic at the latter pH. The minimum pH for growth of the alga was between 4.0 and 4.5. Amino acids and amides, added as a source of nitrogen for growth, were used poorly, if at all, at both pH 5.0 and 7.5. (Author)

AD-626 057 Fld. 6/3
CFSTI Prices: HC $2.00 MF $0.50
TECHNISCHE HOCHSCHULE MUNICH (WEST GERMANY) INSTITUT FUER ANGEWANDTE BOTANIK
PHOTOASSIMILATION OF GLUCOSE BY CHLORELLA IN MONOCHROMATIC LIGHT AND THE INHIBITION BY DCMU AND ANTIMYCIN A.
Final rept.,
by O. Kandler. 1 May 65, 27p. Contract AF-EOAR-53-64
AFOSR 65-2722

Unclassified report

Descriptors: (*Chlorella, Photosynthesis), (*Photosynthesis, Chlorella), Glucose, Monochromatic light, Inhibition, Oxygen, Carbon dioxide, Poisons, Antimetabolites, Phosphorylation, In vivo analysis, West Germany

It was investigated whether monochromatic light beyond 700 millimicrons can bring about light dependent glucose uptake in the absence of O2 and CO2. The effects of DCMU and antimycin A on photoassimilation of glucose were studied. Glucose assimilation proceeds at a high rate even beyond 700 millimicrons. It is inhibited only about 30% by DCMU at a concentration where photosynthesis is completely inhibited. Antimucin A inhibits to 70% where photosynthesis is hardly effected. These results are strong evidence for the existance of cyclic photophosphorylation in vivo. (Author)

AD-626 130 Fld. 6/3, 20/1
ILLINOIS UNIV URBANA BIOPHYSICAL RESEARCH LAB
ULTRASONIC ABSORPTION IN AQUEOUS SOLUTIONS OF HIGH-MOLECULAR-WEIGHT POLYSACCHARIDES,
by S. A. Hawley, L. W. Kessler, and Floyd Dunn. 1965, 4p.

Unclassified report

Availability: Published in The Journal of the Acoustical Society of America v38 n4 p521-3 Oct 1965. Copies to DDC users only.

Descriptors: (*Ultrasonic radiation, Adsorption), (*Polysaccharides, Ultrasonic properties), (*Dextran, Ultrasonic properties), (*Bacterial extracts, Ultrasonic properties), Hemoglobin, Tissue extracts, Proteins, Solutions

The ultrasonic amplitude absorption coefficient was determined in aqueous solutions of four molecular weights (73 000, 186 000, 370 000, and 2 000 000) of dextran, a linear alpha (1 to 6) anhydroglucose polysaccharide of biological origin, over the frequency range 3-69 Mc/sec at 22C. It is found that the concentrationfree absorption spectrum exhibits a remarkable similarity to that of aqueous solutions of beef hemoglobin. The latter finding leads to the conclusion that ultrasonic absorption in tissues is not dominated exclusively by constituent proteins and that the contribution to such absorption by molecular structures lacking tertiary configurations may be considerable. (Author)

AD-626 148 Fld. 6/3
CFSTI Prices: HC $1.00 MF $0.50
AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX
MONTHLY WEIGHT INCREASES IN GROWING RHESUS MONKEYS.
Technical rept.,
by Charles M. Hurst. Dec 65, 22p. Rept. no. ARL-TR-65-24
Proj. AF-6893 Task 689302

Unclassified report

Descriptors: (*Monkeys, Body weight), Females, Males, Adolescents

Weight increase rate profiles were developed for 13 males and 8 female Macaca mulatta based on weights recorded within the stereotaxic acceptability weight range of 2.5 to 4.5 kilograms. It was concluded that adolescent female rhesus have a greater weight increase rate than male rhesus with more extreme weights occurring in the individual female samples. (Author)

AD-626 292 Fld. 6/3, 5/10
ARMY MEDICAL RESEARCH LAB FORT KNOX KY EXPERIMENTAL PSYCHOLOGY DIV
THE RETINAL STRUCTURE OF (AOTES TRIVIRGATUS) THE OWL MONKEY,
by Arthur E. Jones. 1962, 13p. Proj. DA-3A0-14501B71P Task 3A014501B71P08
AMRL 645

Unclassified report

Availability: Published in The Journal of Comparative Neurology v125 n1 p19-27 Aug 1965. Copies to DDC users only.

Descriptors: (*Monkeys, Retina), (*Retina, Monkeys), Vision, Photoreceptors, Optic nerve, Nerve fibers, Ganglia, Neurology, Histology, Morphology (Biology)

Early investigations of photoreceptor morphology in Aotes trivirgatus retina have produced conflicting identification of receptor type. The apparent monochromatic vision of this primate indicates that the entire retina is functionally similar to the human peripheral retina. Direct comparisons were made between retinae of Macaca and Aotes handled the same way and stained at the same time. A number of criteria for classification of receptor type were proposed and discussed. By all criteria the retina of Aotes trivirgatus is determined to be cone free. (Author)

AD-626 368 Fld. 6/3
KENT STATE UNIV OHIO
SOME CHARACTERISTICS OF THE GUINEA PIG ELECTROCARDIOGRAM.
Technical rept.,
by Frances J. Zeman, and Charles G. Wilber. 4 Aug 65, 9p. Contract DA-49-193-MD-2627

Unclassified report

Availability: Published in Life Sciences v4 n23 p2269-74 1965. Copies to DDC users only.

Descriptors: (*Guinea pigs, Electrocardiography), (*Electrocardiography, Guinea pigs), Statistical data, Pulse rate, Body weight

The time-relations of the electrocardiograms of normal, male guinea pigs are given. The data are in agreement with previous work with the exception of a longer P wave. In the relationshiop of Q-T duration to heat rate, using the equation Q-T = K x square root (R-R), K was found to equal 7.94 = 0.81. There was no evidence of correlation between heart rate and body weight in these animals. (Author)

AD-626 370 Fld. 6/3, 6/1
PUERTO RICO UNIV SAN JUAN SCHOOL OF MEDICINE
BIOCHEMICAL CHANGES IN MICE INFECTED WITH SPARGANA OF THE CESTODE, SPIROMETRA MANSONOIDES,
by Elvio H. Sadun, Joseph S. Williams, Frances C. Meroney, and Justus F. Mueller. 11 Nov 64, 6p. Contract DA-49-193-MD-2434 Grant, PHS-AI-01876
AI-01876

Unclassified report

Availability: Published in The Journal of Parasitology v51 n4 p532-6 Aug 1965. Copies to DDC users only.

Descriptors: (*Parasitic diseases, Mice), (*Blood chemistry, Parasitic diseases), Larvae, Hyperglycemia, Phosphoric monoester hydrolases, Calcium, Chlorides, Phosphorus, Enzymes, Glutamic acid, Blood proteins, Glucose, Platyhelminths, Puerto Rico

Newly developed analytical methods permitting accurate measurements of a few microliters of blood have made possible the determination of some of the biochemical changes occurring in mice following infection with the plerocercoid larva of Spirometra mansonoides. Mice infected with this parasite had a postabsorptive hyperglycemia, depressed levels of serum alkaline phosphatase, reduced amounts of serum total protein, essentially normal levels of calcium, chloride, nonprotein nitrogen, phosphorus, acid phosphatase, serum glutamic oxalacetic transminase, and a normal proportion of serum protein components. No significant difference in the mean glucose removal rates was observed in infected mice, as compared with their uninfected controls. The consistency of results indicates that microtechniques may be used to obtain estimations of the serum constituents in mice with parasitic infections. (Author)

AD-626 425 Fld. 6/3
BANGKOK SCHOOL OF TROPICAL MEDICINE (THAILAND)
OPISTHORCHIS VIVERRINI IN THAILAND-THE LIFE CYCLE AND COMPARISON WITH O. FELINEUS,
by Dale E. Wykoff, Chamlong Harinasuta, Pipat Juttijudota, and Max M. Winn. 22 May 64, 7p. Contract DA-MD-49-193-63-G96

Unclassified report

Availability: Published in The Journal of Parasitology v51 n2 p207-14 Apr 1965. Copies to DDC users.

Descriptors: (*Parasitic diseases, Thailand), (*Trematodes, Life cycle), Gastropoda, Fishes, Periodic variations, Adults, Morphology (Biology), Eggs

Of over 6,000 examinees in northeast Thailand, 79% were found to be infected with the human hepatic trematode Ophisthorchis viverrini. Some 90% of all examinees over the age of 10 were positive, and it is estimated that over 3.5 million persons in that country harbor the parasite. The snail hosts are Bithynia goniomphalus, B. funiculata, and B. laevis. The oculate and pleurocercous cercaria resembles that of O. felineus. The flame cell pattern of the cercaria as it leaves the snail host is 2 ((3 + 3) + (3 + 3 + 3)), differentiating it from the cercaria of O. felineus, and establishing O. viverrini and O. felineus as separate species. The most important fish intermediate hosts are Punteus orphoides, Hampala dispar, and Cyclocheilicthys siaja, although a total of nine species were found to harbor the metacercariae. It is postulated, on the basis of seasonal fluctuations, that the largest number of human infections occur during the last portion of the rainy season and the first third of the dry (September to February). The characteristics which have been reported to differentiate adult O. viverrini from O. felineus have been studied but it has not been possible to separate the two species on the morphological characteristics of egg or adult. Thus, although not of practical laboratory significance, at present the only certain means of distinguishing between the two species is the flame cell patterns of cercariae or metacercariae. (Author)

AD-626 483 Fld. 6/3
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA UNIV ST PAUL DEPT OF PLANT PATHOLOGY AND PHYSIOLOGY
SUMMARY REPORT FOR THE PERIOD FROM APRIL, 1964 TO TERMINATION OF PROJECT, JULY 31, 1965,
by C. M. Christensen, G. H. Nelson, C. J. Mirocha, C. E. Dorworth, and L. C. Lopez. 31 Jul 65, 2p. Contract DA-18-064-CML-2832

Unclassified report

Descriptors: (*Grains, Degradation), Storage, Biological contamination, Moisture, Humidity, Seeds, Toxicity, Fungus deterioration, Swine, Toxins + antitoxins, Corn, Yeasts, Plants (Botany)

AD-626 552 Fld. 6/3, 6/15
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
EFFECTS OF HYDROXYUREA ON THE EARLY DEVELOPMENT OF ARBACIA PUNCTULATA,
by Henry W. Eisenberg, Dina Van Pragg, Herbert S. Rosenkranz, and David Shemin. 1965, 1p. Contract Nonr-266 (89) Grant ,NSF-GB-3131

Unclassified report

Availability: Published in Biological Bulletin v129 n2 p4034 Oct 1965. Copies to DDC users only.

Descriptors: (*Urea, Desoxyribonucleic acids), (*Desoxyribonucleic acids, Synthesis), (*Echinodermata, Growth), Embryos, Metabolism, Labeled substances, Ribonucleic acids, In vivo analysis

AD-626 565 Fld. 6/3
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
THE AMPHIPOD GENUS PSEUDALIBROTUS,
by Charlotte Holmquist. 15 Jul 65, 29p. Contract Nonr-3996 (01) Proj. NR-307-105

Unclassified report

Prepared in cooperation with Evertebratavdelningen, Riksmuseum, Stockholm (Sweden).

Availability: Published in Zeitschrift Zool. Syst. Evolutionsforschung v3 n1/2 p19-46 1965. Copies to DDC users only.

Descriptors: (*Crustacea, Morphology (Biology)), Alaska, Distribution, Tables

AD-625 811 **See Fld. 6/12**

AD-625 909 **See Fld. 6/16**

AD-626 016 **See Fld. 6/5**

AD-626 101 **See Fld. 8/1**

AD-626 121 **See Fld. 6/18**

AD-626 122 **See Fld. 6/18**

AD-626 220 **See Fld. 8/6**

AD-626 276 **See Fld. 8/6**

AD-626 317 **See Fld. 8/1**

AD-626 559 **See Fld. 6/1**

6/4. BIONICS

AD-625 719 Fld. 6/4, 9/2
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
ALCHEMY AND ARTIFICIAL INTELLIGENCE,
by Hubert L. Dreyfus. Dec 65, 95p. Rept. no. P-3244

Unclassified report

Descriptors: (*Artificial intelligence, Digital computers), Programming (Computers), Simulation, Problem solving, Game theory, Machine translation, Pattern recognition

Early successes in programming digital computers to exhibit simple forms of intelligent behavior, coupled with the belief that intelligent activities differ only in their degree of complexity, have led to the conviction that the information processing underlying any cognitive performance can be formulated in a program and thus simulated on a digital computer. Attempts to simulate cognitive processes on computers have, however, run into greater difficulties than anticipated. An examination of these difficulties reveals that the attempt to analyze intelligent behavior in digital computer language systematically excludes three fundamental human forms of information processing (fringe consciousness, essence/accident discrimination, and ambiguity tolerance). Moreover, there are four distinct types of intelligent activity, only two of which do not presuppose these human forms of information processing and can therefore be programmed. Significant developments in artificial intelligence in the remaining two areas must await computers of an entirely different sort, of which the only existing prototype is the little-understood human brain. (Author)

AD-625 869 Fld. 6/4, 6/16
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA UNIV PHILADELPHIA
FINAL PROGRESS REPORT JULY 15, 1964 TO MARCH 31, 1965,
by Lysle H. Peterson. 1 Nov 65, 12p. Contract Nonr-551 (18) Proj. NR-102-387

Unclassified report

Descriptors: (*Cardiovascular system, Physiology), (*Bionics, Cardiovascular system), Nervous system, Endocrine glands, Kidneys, Simulation, Mathematical models, Muscles, Arteries

The general aim of the program was to establish a 'model' of the manner (s) in which the nervous, endocrine and renal systems interact with the cardiovascular system in the control and regulation of cardiovascular functions. The model contains many variables and parameters interacting through many feedback loops.

AD-625 759 **See Fld. 6/16**

AD-625 895 **See Fld. 7/4**

AD-625 983 **See Fld. 5/10**

AD-626 155 **See Fld. 9/2**

AD-626 173 **See Fld. 5/8**

6/5. CLINICAL MEDICINE

AD-625 665 Fld. 6/5, 6/13
CFSTI Prices: HC $4.00 MF $0.75
ARMY TROPICAL RESEARCH MEDICAL LAB APO 851 NEW YORK
ANNUAL PROGRESS REPORT, FY 1965.
Annual rept. 1 Jul 64-30 Jun 65,
by Lyman P. Frick. 30 Sep 65, 119p.

Unclassified report

Descriptors: (*Medical research, Army), (*Military medicine, Army research), Communicable diseases, Immunology, Metabolism, Nutrition, Diarrhea, Parasitic diseases, Chromosomes, Deficiency diseases, Arboviruses, ECHO virus, Schistosoma, Diseases, Gastrointestinal system, Electron microscopy, Mucus, Membranes (Biology), Biopsy, Enzymes

The research program of the U. S. Army Tropical Research Medical Laboratory is devoted to the study of tropical diseases of military importance. The research projects described are related to investigations of Schistosomiasis, Tropical Sprue and Common Diarrheas. (Author)

AD-625 675 Fld. 6/5, 6/16
BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE
SOME EFFECTS OF AUTOLOGOUS AND HOMOLOGOUS BLOOD OR PLASMA OVERTRANSFUSIONS IN THE DOG,
by R. A. Huggins, E. L. Smith, and S. Deavers.
28 Dec 64, 8p. Contract DA-49-193-MD-2357
Grant ,PHS-HE-08793-01
Unclassified report

Availability: Published in the American Journal of Physiology v209 n4 p673-9 Oct 1965. Copies to DDC users only.

Descriptors: (*Blood transfusions, Pathology), Histamine, Blood proteins, Dextran, Antihistaminics, Blood plasma, Blood pressure, Blood circulation

Plasma volume, protein concentration, mean arterial pressure, urticaria, and survival rates were observed in morphine-pentobarbitalized dogs overtransfused with either dextran, homologous blood, reconstituted homologous blood, autologous frozen stored, homologous frozen stored, or fresh plasma. The principal reaction and only difference between responses with autologous plasma and homologous blood and plasma was the development of urticaria with homologous blood (10%), homologous plasmas (70-90%), and reconstituted homologous blood (100%). Significant amounts of fluid and protein were lost with all overtransfusions; this loss was not correlated with the urticaria. Of five dogs developing urticaria, three had an increased plasma histamine level. Diphenhydramine hydrochloride reduced the incidence of urticaria from 100 to 20%. Blood group incompatibility was not involved. There was a direct relationship between handling of blood and urticaria, and it is postulated that, during handling, a substance is activated which causes the release of endogenous histamine and production of urticaria. (Author)

AD-625 746 Fld. 6/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
IMMUNOLOGICAL INTERACTION BETWEEN ALLOGENEIC AND XENOGENEIC SPLEEN CELL MIXTURES IN VITRO: STIMULATION OF DNA SYNTHESIS,
by R. K. Main, and L. J. Cole. 19 Oct 65, 23p.
Rept. no. USNRDL-TR-922
Task MR005.08-1200
Unclassified report

Descriptors: (*Immunology, Transplantation), (*Transplantation, Immunology), Spleen, Cells (Biology), Tissue culture, In vitro analysis, Desoxyribonucleic acids, Synthesis, Nucleosides, Lymphocytes, Genetics, Antigens + antibodies, Immunity, Rats, Mice

An early (after 24 hours) proliferative response (measured by 3H-thymidine uptake) followed mixing and culture in vitro of spleen cell suspensions derived from certain genetically unrelated rodents. This response reached a maximum value at 40-44 hours. When either component of the mixture in equivalent amounts was cultured alone (as a control) only a limited response occurred. This marked stimulation of DNA synthesis occurred when spleen cells derived from LAF1 mice and a pool of spleen cells from three noninbred rats were mixed and cultured. No such response occurred in the mouse spleen cultures either, (a) in the absence of rat spleen cells or, (b) in the presence of disrupted (frozenthawed) rat spleen cells. A similar response occurred when spleen cells from one rat were mixed and cultured either (c) with C57BL10J (or DBA/2J) mouse spleen cells or, (to a less marked extent), (d) with spleen cells from a second unrelated noninbred rat. A similar marked response occurred in such mixtures derived from C57BL10J and DBA/2J and from BALB/c and C3H/HeJ mice. The data, insofar as they now extend, clearly suggest that the response of these rodent spleen cells in the mixed lymphocyte culture (MLC) test is dependent on certain genetic differences inherent in the two cell populations. (Author)

AD-625 810 Fld. 6/5
CFSTI Prices: HC $1.00 MF $0.50
ARMY MEDICAL BIOMECHANICAL RESEARCH LAB WALTER REED ARMY MEDICAL CENTER WASHINGTON D C
LABORATORY EVALUATION OF MECHANICAL HAND SIZE III.
Final rept.,
by John W. Hodge,Jr.. Sep 65, 8p. Rept. no. TR-6518
Proj. 3A014501A71E-03
Unclassified report

Descriptors: (*Hands, Prosthetics), (*Prosthetics, Hands), Measurement, Models (Simulations)

Two models of mechanical hand Size III were laboratory evaluated for functional characteristics, dimensions, and weight. On the basis of the results obtained it was felt that the hands were ready for field tests. (Author)

AD-625 842 Fld. 6/5, 13/2
CFSTI Prices: HC $1.00 MF $0.50
TOKYO UNIV (JAPAN) SCHOOL OF MEDICINE
STUDIES ON RESPIRATORY DISEASES DUE TO AIR POLLUTION IN TOKYO-YOKOHAMA AREA.
Semi-annual rept. 15 Apr-14 Oct 64,
by Tatsushi Ishizaki. 14 Oct 64, 4p. Contract
DA-92-557-FEC-37308
ARDG (FE) J-188
Unclassified report

Descriptors: (*Respiratory diseases, Air pollution), (*Air pollution, Respiratory diseases), Japan, Allergy, Lungs, Climatology, Industrial medicine

Investigations were made concerning the relationship between asthmatic attack, weather and air pollution; the effect of air pollution upon allergic condition; and pulmonary function.

AD-625 943 Fld. 6/5, 6/13
CFSTI Prices: HC $1.00 MF $0.50
KEIO UNIV TOKYO (JAPAN) SCHOOL OF MEDICINE
IMMUNOLOGICAL ASPECTS OF EXPERIMENTAL TOXOPLASMOSIS.
Semi-annual rept. 28 May-27 Nov 64,
by Hisakichi Matsubayashi. 27 Nov 64, 6p. Contract DA-CRD-AG-S92-544-64-G21
ARDG (FE) J-185
Unclassified report

Descriptors: (*Toxoplasma, Immunity), Immunology, Diseases, Infectons, Tolerances (Physiology), Vaccines, Immune serums, Antigens + antibodies, Antimetabolites, Mice, Japan

Mice which survived a prior infection with low virulent toxoplasmas (Beverley strain) tolerated a challenge infection with a highly virulent strain (RH strain). Of 35 mice which survived the challenge infection with RH, the brains of 22 of these mice were shown to contain living organisms. Vaccination with heat-killed Toxoplasma alone or in incomplete adjuvants seemed to have no effect in increasing the protection of the mice against a challenge RH infection. Vaccination with sonic disrupted Toxoplasma also failed to protect mice against a RH challenge. Passive immunization with anti-toxoplasma sera obtained from infected rabbits and pigs demonstrated very little effects in prolongation of the survival period of infected mice. Development of cellular immunity to some degree was indicated by the experiments employing implanted diffusion chambers in the peritoneal cavity of mice. The role of antibody in the formation of the cyst of Toxoplasma was investigated. The anti-metabolite 6-mercaptopurine was inoculated into infected mice in order to inhibit the normal immune response of the mice to the parasite. The results tend to indicate that antibody is not an essential prerequisite to cyst formation. (Author)

AD-625 953 Fld. 6/5, 6/15
CFSTI Prices: HC $1.00 MF $0.50
SASAKI FOUNDATION MEDICAL INSTITUTION TOKYO (JAPAN)
NATURAL DRUG RESISTANCE OF HETEROGENEOUS SINGLE CELL TRANSPLANTS.
Semi-annual rept. on J-202, 17 Sep 64-16 Mar 65,
by Tomizo Yoshida. 16 Mar 65, 4p. Contract
DA-CRD-AG-S92-544-64-G27
Unclassified report

Descriptors: (*Cancer, Drugs), (*Drugs, Resistance (Biological)), Transplantation, Cells (Biology), Chromosomes, Japan

The present study attempts to demonstrate precisely the following points: (a) whether cellular constitution of a clonal cancer cell population is uniform as regards the degree of natural drug resistance; (b) whether the degree of drug resistance of cancer clone fluctuates during animal passages; and (c) whether any correlation is found between the degree of drug resistance and chromosonal constitution of cells in a cancer clone. The drug resistance under question in this case is not acquired but natural one.

AD-625 996 Fld. 6/5
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
CHANGES IN BODY COMPOSITION DURING WEIGHT REDUCTION IN OBESITY. BALANCE STUDIES COMPARING EFFECTS OF FASTING AND A KETOGENIC DIET.
Interim rept.,
by Frederick L. Benoit, Robert L. Martin, and Raymond H. Watten. 9 Mar 65, 12p. Rept. no. CIC-TR-17
Contract Nonr-222 (51) Proj. NR-105-156
Unclassified report

Availability: Published in Annals of Internal Medicine v63 n4 p604-12 Oct 1965. Copies to DDC users only.

Descriptors: (*Body weight, Reduction), (*Obesity, Diet), Starvation, Biochemistry, Fats, Therapy

Gross body composition was compared in seven obese male subjects after equal periods of fasting and of a low calorie, high fat diet. The data show that the weight loss while fasting was 64.6% due to loss of lean body tissue and only 35.4% due to loss of adipose tissue. In contrast, the weight change while on the high fat diet was only 3% due to lean tissue loss and the mean total amount of body fat lost exceeded that of fasting (6.4 kg versus 3.4 kg). These results suggest that although clinically desirable weight reduction occurs during fasting, it is at the expense of lean tissue, which is physiologically undesirable. (Author)

AD-625 999 Fld. 6/5, 6/15
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
CHLORPROMAZINE-INDUCED EMPHYSEMA.
Interim rept.,
by Richard F. McLaughlin,Jr., Walter S. Tyler, Donald W. Edwards, Gerald L. Crenshaw, and

Robert O. Canada. 21 Dec 64, 15p. Rept. no. CIC-TR-18
Contract Nonr-222 (51) Proj. NR-105-156
Unclassified report

Availability: Published in The American Review of Respiratory Diseases v92 n4 p597-608 Oct 1965. Copies to DDC users only.

Descriptors: (*Chlorpromazine, Respiratory diseases), (*Respiratory diseases, Etiology), Lungs, Diseases, Pathology, Equines

To further elucidate the pathogenesis of pulmonary emphysema, ten normal horses were subjected to thoracotomy and their proximal bronchial arteries were injected with chlorpromazine, an antioxidant which regularly produces a severe, necrotizing obliterative endarteritis. In seven animals, it was possible to observe the sequence of changes, both the early and long-term, due to the chlorpromazine injections. In the period between thirty hours and three weeks, severe necrotizing lesions with edema, interstitial hemorrhage and inflammatory reaction were seen in all parenchymal elements. In the two animals that survived beyond twelve weeks, extensive focal atrophic changes occurred that were similar in pathologic anatomy to chronic pulmonary emphysema in man. (Author)

AD-626 003 Fld. 6/5
TULANE UNIV NEW ORLEANS LA SCHOOL OF MEDICINE
RADIOHIPPURAN ACCUMULATION IN THE TRANSPLANTED KIDNEY AS A SIGNAL OF REJECTION,
by Jack E. Mobley, and J. U. Schlegel. 15 Aug 64, 4p. Contract Nonr-475 (07)
Unclassified report

Availability: Published in Surgery v58 n5 p815-8 Nov 1965. Copies to DDC users only.

Descriptors: (*Kidneys, Transplantation), Etiology, Pathology, Urine, Excretion, Kidney function tests, Labeled substances, Radioactivity, Edema

Certain changes have been noted in the radiohippuran renograms and renal photoscans of patients who have undergone renal heterotransplantation. The renographic changes consist of prolongation of the interval from injection of radiohippuran to the peak of the renographic curve and a prolonged excretory phase, the former being the most significant change. The renal photoscan shows an abnormal retention of radioactivity within the kidney coincident with the changes noted in the renogram. It is suggested that these alterations may be related to the intrarenal edema which is part of the rejection phenomenon, and that they may have diagnostic and prognostic value. Apparently normal renal function in a patient 7 months after renal heterotransplantation is reported. (Author)

AD-626 016 Fld. 6/5, 6/3
NATIONAL JEWISH HOSPITAL DENVER COLO
ANTIBODY FORMATION IN GUINEA PIGS BRED AT HIGH ALTITUDE,
by I. L. Trapani. 1964, 1p. Contract Nonr-3545 (00) Grant ,PHS-AI-05840-01 88
Unclassified report

Availability: Published in Federation Proceedings v24 n2 Mar-Apr 1965. Copies to DDC users only.

Descriptors: (*Immunity, Higl. altitude), (*Guinea pigs, High altitude), (*High altitude, Immunity), Antigens + Antibodies, Acclimatization, Stress (Physiology), Adaptation (Physiology), Reproduction (Physiology), Environment

A random bred closed stock colony of albino guinea pig has been established at the Echo Lake Laboratory (altitude=10,600 ft.) of the Denver University High Altitude Laboratories, Mt. Evans, Colorado. The importance of this colony is to provide animals which are not subjected to the stress of a change in environment, but are exposed to high-altitude. Another colony of this same strain of guinea pig is maintained in our Denver laboratories (altitude=5,280 ft.). The following groups of animals were used: 1) bred and used in Denver; 2) bred in Denver and adapted to 10,600 ft; 3) bred in Denver and adapted to 14,150 ft; 4) bred at Echo Lake and adapted in Denver; 5) bred and used at Echo Lake; and 6) bred at Echo Lake and adapted to 14,150 ft. There were 15 animals in groups 1,2,3,4 and 6; and 120 animals in group 5. After the adaption period half of each group was immunized with 10 mg BSA in saline or with 10 mg BSA adsorbed to 40 mg bentonite in saline. All animals were bled prior to immunization and weekly for 5 weeks post-immunization. Hemagglutination titers showed BSA-bentonite immunization to be more efficacious than BSA alone, and group 5, bred at Echo Lake and maintained there, exhibited the highest titers of all groups tested. (Document quoted in its entirety.)

AD-626 022 Fld. 6/5, 6/13
ILLINOIS UNIV URBANA COLL OF VETERINARY MEDICINE
HETEROGENEITY OF SHEEP DIPHTHERIA AND TETANUS ANTIBODIES,
by R. F. Locke, and D. Segre. 1 Feb 65, 8p.
Contract Nonr-1834 (37) Proj. NR-103-509
Unclassified report

Availability: Published in The Journal of Immunology v95 n3 p480-6 1965. Copies to DDC users only.

Descriptors: (*Globulins, Mammals), (*Antigens + antibodies, Globulins), (*Corynebacterium, Toxins + antitoxins), (*Clostridium tetani, Toxins + antitoxins), Immune serums, Vaccines, Diseases, Gamma globulin, Molecular weight, Electrophoresis, Chromatographic analysis, Intestines, Swine, Immunity

The ultracentrifugal patterns of ovine immune globulin revealed two peaks, the major peak having a sedimentation coefficient (S sub 20, W) of 6.6 S while the smaller peak sedimented at 18S. Heat treatment (65C for 1 hr) destroyed the globulin sedimenting at 18S. The sedimentation pattern of the 6.6 S globulin was unaffected. Globulin sedimenting at 6.6 S had a molecular weight of 174, 000. The faster dsedimenting 18 S globulin had a molecular weight of about 1 million. The administration of diphtheria and tetanus toxoids to sheep was followed by the production of heat labile 18 S antibodies, which reached a peak titer on the 7th day. Heat stable 6.6 S antibodies were not detectable until the 9th day and their titer rose sharply thereafter. Early response ovine antitoxin appeared to be composed largely of 18 S antibodies. Most of the antibody activity of hyperimmune sheep antitoxin was found to be concentrated in the 6.6 S globulin. The antibody activity of electrophoretically separated globulin fractions of higher mobility was destroyed by heating at 65C for 1 hr. The titers of globulin fractions of lower mobility were enhanced by the application of this level of heat. Chromatographic subfractionation of purified 6.6 S gamma 2-globulin revealed the presence of tetanus antibodies in two subfractions, one of low and the other of intermediate electrophoretic mobility. Diphtheria antibodies were concentrated in a single fraction of intermediate mobility. (Author)

AD-626 027 Fld. 6/5
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
CARIOSTATIC ACTION OF FAT-IMBEDDED POTASSIUM PHOSPHATE WHEN FED IN THE DIET OF RATS,
by R. S. Harris, Norma B. Walsh, and A. E. Nizel. 28 Oct 64, 8p. Contract Nonr-1841 (32) Proj. NR-105-094
Unclassified report

Presented at the Meeting of the International Association of Dental Research (40th), St. Louis, Mar 62.

Availability: Published in Archives of Oral Biology v10 p477-83 1965. Copies to DDC users only.

Descriptors: (*Phosphates, Teeth), (*Teeth, Diseases), Dentistry, Potassium compounds, Hydrogenation, Fats, Colloids, Diet, Rats

Granular potassium dihydrogen phosphate was imbedded by mixing into hydrogenated lard, cooling and pulverizing. It was added to a cariogenic diet in amounts sufficient to double the phosphorus content of the diet to 0.8 per cent. Other batches of this diet were supplemented either with the lard alone, or with lard and the granular KH2PO4 mixed into the diet separately. In two successive experiments these three diets and the control unsupplemented diet were fed to groups of twenty-four rats each beginning when they were 8 days old. They were then sacrificed, and the dental caries of the molars were scored. No significant differences between groups were noted with respect to diet consumption, body weight gain, femur length or the phosphorus content of blood serum and saliva. The four diet groups (control diet, control diet + 5.2 per cent hydrogenated lard, control diet + 5.2 per cent hydrogenated lard + 1.73 per cent KH2PO4, and control diet + 1.73 per cent KH2PO4 imbedded in 5.2 per cent hydrogenated lard) showed average caries scores, respectively, as follows: Series I, 18.9, 22.9, 9.3 and 4.6; Series II, 24.8, 43.7, 17.8 and 9.8. Thus, the addition of fully hydrogenated lard (m.p. 61-65C) to the diet caused a significant increase in caries. Although the lard-imbedded phosphate was essentially insoluble in water, it was significantly more cariostatic than the unimbedded phosphate. (Author)

AD-626 028 Fld. 6/5
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
CARIOSTATIC EFFECTS OF THREE TYPES OF PHOSPHATES WHEN FED SINGLY OR IN COMBINATIONS IN THE DIETS OF RATS,
by Robert S. Harris, Salil K. Das, and Abraham E. Nizel. 14 Apr 64, 5p. Contract Nonr-1814 (32)
Unclassified report

Presented at the General Meeting of the International Association for Dental Research (42nd), Los Angeles, Mar 64.

Availability: Published in Journal of Dental Research v44 n3 p549-53 May-Jun 1965. Copies to DDC users only.

Descriptors: (*Phosphates, Teeth), (*Teeth, Diseases), Dentistry, Diet, Kidneys, Rats, Tables

The phosphorus content of a caries-producing diet was doubled to 0.8 per cent by additions of either sodium orthophosphate, metaphosphoric acid, or sodium trimetaphosphate, either singly or together on an equiphosphorus basis. These eight diets were fed to groups of thirty rats for 13 weeks beginning when they were 8 days old. The following caries scores were observed: control 17.3, ortho- 9.1, meta- 5.5, trimeta- 0.8, ortho-meta7.4, ortho-trimeta- 4.5, meta-trimeta- 1.7, and orthometa-trimeta- 2.2. All three phosphates were cariostatic when fed singly, the orthophosphate being the weakest and the trimetaphosphate the strongest. The cariostatic effect of orthophosphate and metaphosphate when fed together on an equiphosphorus basis was additive. The cariostatic effects from feeding trimetaphosphate with either orthophosphate or metaphosphate were more than additive, indicating that the trimetaphosphate exerted a synergistic effect. A similar effect was noted when all three phosphates were fed together. The kidneys of all rats that were fed phosphate-fortified diets were as much as 24 per cent (males) and 34 per cent (females) heavier than the control group.

The trimetaphosphate had less effect on kidney weight than the other phosphate; in fact it appeared to counteract the renal enlargement resulting from these phosphates. (Author)

AD-626 029 Fld. 6/5, 14/2
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
QUANTITATIVE TECHNIQUE FOR PULVERIZING RODENT TEETH,
by Abraham E. Nizel, Juan M. Navia, Joan R. Moorand , and Robert S. Harris. 25 Mar 64, 1p. Contract Nonr-1841 (32) Grant ,PHS DE-01438-03

Unclassified report

Availability: Published in Journal of Dental Research v43 n6 p1257 Nov-Dec 1964. Copies to DDC users only.

Descriptors: (*Teeth, Grinding), Rodents, Dentistry, Processing

AD-626 030 Fld. 6/5
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
EFFECTS OF CATIONS ON THE CARIOSTATIC ACTIVITY OF ORTHOPHOSPHATES,
by Robert S. Harris. 27 Jan 64, 6p. Contract Nonr-1841 (32)

Unclassified report

Availability: Published in Journal of Dental Research v44 n2 p416-20 Mar-Apr 1965. Copies to DDC users only.

Descriptors: (*Phosphates, Teeth), (*Teeth, Diseases), Dentistry, Diet, Sodium compounds, Potassium compounds, Calcium compounds, Salts, Rats

Mono- and di-basic salts of Na, K, and Ca orthophosphate were pulverized, incorporated in various proportions into a caries-producing diet in sufficient amounts to d d dodouble the P content of this diet, and fed to groups of 30 rats for 90 days beeb beginning when they were 8 days old. In comparison with the control group, the caries scores were reduced by 81 per cent, 71 per cent, and 29 per cent when the Na, K, or Ca salts, respectively, supplied two-thirds of the P supplement. The caries reduction was 45 per cent when these salts were added in equal amountnunts. Thus Na and K orthophosphates aare highly effective in the prevention of experimental caries in rats, while Ca orthophosphate is only slightly cariostatic. Furthermore, the Ca salt appears to interfere with the action of Na and K orthophosphates when the three are fed together. (Author)

AD-626 119 Fld. 6/5, 5/10
SYRACUSE UNIV N Y BIOACOUSTICS LAB
THE PROBLEM OF MEASURING AUDITORY ADAPTATION,
by H. N. Wright. 1964, 5p.

Unclassified report

Availability: Published in International Audiology v2 n2 p206-10 Dec 1963. Copies to DDC users only.

Descriptors: (*Audiometry, Test methods), Auditory perception, Adaptation (Physiology), Psychoacoustics, Ear, Audiofrequency, Errors

AD-626 135 Fld. 6/5
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DIV OF COMMUNICABLE DISEASE AND IMMUNOLOGY
ALIMENARY HYPERSENSITIVITY INDUCED BY GIARDIA LAMBLIA. REPORT OF A CASE OF ACUTE MEAT INTOLERANCE,
by Scott B. Halstead, and Elvio H. Sadun. 26 Jun 64, 6p.

Unclassified report

Availability: Published in Annals of Internal Medicine v62 n3 p564-9 Mar 1965. Copies to DDC users only.

Descriptors: (*Zoomastigina, Parasitic diseases), (*Gastrointestinal system, Parasitic diseases), (*Allergy, Meat), Diarrhea, Tolerances (Physiology), Diet, Mammals, Pain, Medical examination, Biopsy, Blood analysis, Pathology, Diagnosis, Therapy, Drugs, Dosage, Abdomen

A case of Giardia lamblia infection associated with attacks of abdominal pain after eating mammalian meat is described. Pain syndrome followed experimental reinfection by 7 weeks. Biopsy of the duodenum showed marked eosinophilic infiltration of the lamina propria. Hypotheses of the pathogenesis of this syndrome are discussed. (Author)

AD-626 136 Fld. 6/5
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DIV OF COMMUNICABLE DISEASE AND IMMUNOLOGY
SEROLOGICAL CROSS REACTIVITY BETWEEN PLASMODIUM VIVAX AND PLASMODIUM FALCIPARUM AS DETERMINED BY A MODIFIED FLUORESCENT ANTIBODY TEST,
by Carter L. Diggs, and Elvio H. Sadun. 11 Dec 63, 7p.

Unclassified report

Availability: Published in Experimental Parasitology v16 n2 Apr 1965. Copies to DDC users only.

Descriptors: (*Serodiagnosis, Plasmodium), (*Plasmodium, Fluorescent antibody techniques), Antigens + antibodies, Diseases, Hemosporidia, Blood serum, Antigen - antibody reactions, Immunology, Parasitic diseases

The cross reactivity between P. vivax and P. falciparum was studied by an indirect fluorescent antibody (FA) technique in which homologous and heterologous antigen antibody systems were used. Two modifications of the previously described test were employed: (1) the use of liquid nitrogen for the preservation of parasitized whole blood for use as the source of antigen and (2) the use of Evans blue as a counterstain to decrease the intensity of nonspecific fluorescence. Six of 29 sera from natural P. vivax infections reactive with P. vivax antigen were also reactive with P. falciparum antigen. Eleven of 21 serologically positive sera from natural P. falciparum infections were reactive with P. vivax antigen, two of these with the P. vivax antigen only. Two groups of sera from human volunteers with either P. vivax or P. falciparum infections were titrated in parallel tests with homologous and heterologous antigen. In the first series the geometrical mean reciprocal titers (GMRT's) with P. falciparum, sera were 28.3 for the homologous antigen and 6.3 for the heterologous antigen. For the P. vivax sera the values were 17.2 and 9.3 for the homologous and heterologous cases, respectively. In the second series the values for the P. falciparum sera were 132 with the homologous antigen and 20.0 with the heterologous antigen: the P. vivax sera gave values of 30.0 and 11.9 with the homologous and heterologous antigens, respectively. (Author)

AD-626 209 Fld. 6/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL DENTAL SCHOOL BETHESDA MD
ABSTRACTS OF RESEARCH REPORTS.
Jun 65, 12p.

Unclassified report

Descriptors: (*Dentistry, Abstracts), Necrosis, Diseases, Mouth, Teeth, Hamsters, Radiotherapy, Throat, Local anesthetics, Contamination, Toilet articles, Prosthetics, Storage, Mercury alloys, Silver, Plating, Degradation, Steel, Aging (Materials), Polishes, Zironium compounds, Silicates, Tobacco, Tongue

Contents: An attempt to produce necrotizing ulcerative gingivitis in the stressed hamster; Clinical evaluation of radiation therapy to the oral, nasal, pharyngeal region; Clinical evaluation of a self-contained tooth-cleaning implement; Contamination of local anesthetic solution in cartridges; Determination of the effect of cavity liner on retention of dental castings cemented in place with oxyphosphate cement; Determination of optimum pouring time of rubber base impression material; Effect of storing preproportional mercury-alloy on a physical property of the amalgam; Effects of temperature on silver plating rubber base impression material in a high-speed commercial bath; Evaluation of the deterioration of carbon steel dental instruments during sterilization in the ethylene oxide sterilizer; Evaluation of the effect of various curing methods on the strength of autopolymer resin repairs; Evaluation of the sterilization of air-driven handpieces; Incidence of accessory root canals in molars; Microscopic comparison of the ability of zirconium silicate and pumice to polish root surfaces; Nonmechanical solvents and their action upon tobacco tars; Tongue stereognosis in relation to two-point threshold.

AD-626 279 Fld. 6/5
CFSTI Prices: HC $4.00 MF $0.75
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
MILITARY MEDICAL JOURNAL, NO. 6, JUNE, 1962.
Nov 65, 121p. Rept. no. ACSI-I-4777
TT 66-60227

Unclassified report

Trans. of Voenno-Meditsinskii Zhurnal (USSR) n6 96p 1962.

Descriptors: (*Military medicine, USSR), Pathology, Diseases, Therapy, Blood diseases, Antigens + antibodies, Hormones, Gastrointestinal system, Cardiovascular diseases, Diagnosis, Epidemiology, Tolerances (Physiology), Hygiene, Nutrition, Virus diseases, Bacteria, Aviation medicine, Hypoxia, Surgery, Wounds + injuries, Healing, Flight simulators, Microphotography, Body temperature, Artificial respiration, Reviews, Bibliographies, Periodicals

AD-626 280 Fld. 6/5
CFSTI Prices: HC $4.00 MF $0.75
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
MILITARY MEDICAL JOURNAL, 1964, NO. 11.
1965, 111p. Rept. no. ACSI-I-7233
TT 66-60228

Unclassified report

Trans. of Voenno-Meditsinskii Zhurnal (USSR) n11 97p 1964.

Descriptors: (*Military medicine, USSR), Diseases, Therapy, Infectious hepatitis, Diagnosis, Rheumatic diseases, Wounds + injuries, Influenza virus, Medical personnel, Hematology, X rays, Respiratory diseases, Gastrointestinal system, Bacteria, Urine, Vitamins, Pressure breathing, Atherosclerosis, Aviation medicine

AD-626 387 Fld. 6/5
SCRIPPS CLINIC AND RESEARCH FOUNDATION LA JOLLA CALIF
APPLICATION OF FLUORESCENCE POLARIZATION TO THE ANTIGEN-ANTIBODY REACTION. THEORY AND EXPERIMENTAL METHOD,
by Walter B. Dandliker, H. C. Schapiro, J. W. Meduski, R. Alonso, and George A. Feigen. 13 Mar 64, 28p. Contract PHS-AM-07508 ,PHS-HC-03693-05

Unclassified report

Availability: Published in Immunochemistry v1 p165-91 1964. Copies to DDC users only.

Descriptors: (*Fluorescent antibody techniques, Polarization), Thermodynamics, Labeled substances, Antigens + antibodies, Least squares method, Programming (Computers), Antigen-antibody reactions

A theory for the interpretation of fluorescence polarization measurements applied to molecular interaction is presented. The interaction occurs between one kind of molecule which bears a fluorescent label and another which may or may not be fluorescent. A concept, 'excess fluorescence' is developed in much the same way as that of excess turbidity and corrects for the contribution of the background to the polarization. Thermodynamic results are obtained in the form of an association constant, K sub o, a concentration of binding sites, F sub b max and a measure a of the heterogeneity of association constant. Using this technique the reaction between fluorescein-labeled ovalbumin and antibody under a variety of circustances has been investigated. Fluorescence polarization titrations have been performed with a few micrograms of antibody protein per ml. To facilitate processing of data a least-squares program for the IBM 7090 digital computer has been devised. (Author)

AD-626 402 Fld. 6/5
NORTH CAROLINA UNIV CHAPEL HILL
THE IDENTIFICATION OF ANNUAL PEAK PERIODS FOR A DISEASE,
by H. A. David, and D. J. Newell. 1963, 6p.
Contract DA-ARO (D)-31-124-G670
AROD 4967:4

Unclassified report

Availability: Published in Biometrics v21 n3 p645-50 Sep 1965. Copies to DDC users only.

Descriptors: (*Biometry, Diseases), (*Diseases, Statistical analysis), Statistical tests, Distribution, Mortality rates

When frequencies of the occurrence of some phenomenon are available on a monthly or other cyclic basis a simple test for possible periodic effects is obtained by comparing totals over two halves of the cycle. For example, totals for six consecutive months are contrasted with totals for the remaining (not necessarily consecutive) months. Often the line of demarcation between the two halves is arbitrary and the test will then be based on the largest difference which can be constructed. Allowance can be made for this selection effect by means of the upper 5% and 1% points of the largest contrast, which are presented in this paper. A numerical example is given and other methods of analysis are mentioned. (Author)

AD-626 473 Fld. 6/5, 5/9, 5/10
CFSTI Prices: HC $3.00 MF $0.75
CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
THE EDGEWOOD ARSENAL MEDICAL VOLUNTEER PROGRAM: SELECTION, PERFORMANCE, AND PREDICTION.
Interim rept., Jun 63-Oct 64,
by Paul B. Fiddleman. Dec 65, 94p. Rept. no. CRDL-Special pub-2-65
Task 1C522301A7901

Unclassified report

Descriptors: (*Medical research, Army personnel), (*Army personnel, Selection), Humans, Statistical data, Acceptability, Motivation, Recruiting, Psychometrics, Research program administration, Tables

The Medical Volunteer Program at Edgewood Arsenal is described. The dual objective of the program is to improve selection procedures and to study a large group of normal individuals comprising a cross section of US Army personnel. The demographic characteristics of 421 individuals selected as medical volunteers are tabulated. Variables include means and frequency distributions of age, education, family background, intellectual level, and military occupation. The report includes selection procedures, estimates of rejection and acceptance rates, and individual volunteer performance. Although no hypotheses are formulated, as a final step, a number of rejectees and acceptees and poor volunteers and very good volunteers could be matched according to the variables listed above. The next interim report will compare accepted volunteers and rejected individuals. (Author)

AD-626 493 Fld. 6/5, 6/1
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
ON THE SIGNIFICANCE OF THE HETEROGENEITY IN MOLECULAR SIZE OF HUMAN SERUM GAMMA AGLOBULINS,
by J. P. Vaerman, H. H. Fudenberg, C. Vaerman, and W. J. Mandy. 19 Dec 64, 23p. Contract Nonr-3656 (12) Grant ,PHS-HE-05997 Proj. NR-105-308

Unclassified report

Availability: Published in Immunochemistry v2 p263-72 1965. Copies to DDC users only.

Descriptors: (*Gamma globulin, Molecular properties), Blood serum, Electrophoresis, Peptides, Proteins, Polymerization, Immunology, Pathology

The present investigations were designed to explore the relationship of gamma A-globulins of differing S rates. For this purpose the isolated 7S and 10.5S components of gamma A-globulin of a single normal individual and the isolated 7S and 17S gamma A-paraproteins of a patient with typical multiple myeloma were studied by various biochemical and immunologic techniques. Starch-gel electrophoresis in urea at acid pH showed no apparent differences between the L chains of the 7S and 10.5S normal gamma A-globulins; the same was true of the H chains of each preparation. The polypeptide chains of the partially or fully reduced-alkylated 7S and 17S A-myeloma proteins were also studied by urea starch-gel electrophoresis and fingerprinting. The two proteins were closely similar in every respect. The results are compatible with the hypothesis that the heterogeneity in S rate of gamma A-globulin is due to polymerization. (Author)

AD-626 507 Fld. 6/5, 5/10
CALIFORNIA UNIV LOS ANGELES BRAIN RESEARCH INST
THE HIPPOCAMPUS AND THE ORIENTING REFLEX,
by M. Radulovacki, and W. R. Adey. 19 Nov 64, 18p. Contract AF-AFOSR-246-63 Proj. AF-7164 Task 716402
AFOSR 65-1778

Unclassified report

Availability: Published in Experimental Neurology, v12 n1 p68-83 May 1965. Copies to DDC users only.

Descriptors: (*Brain, Electrophysiology), (*Behavior, Electroencephalography), Lysergic acids, Reflexes, Nervous system, Amines, Neurology, Drugs, Cats

Averages of hippocampal wave trains are computed from a cat's daily trials in discrimination and in orienting responses. Alerted but nonperforming animals exhibit a wide spectrum of theta wave activity in the range 3 to 7 cycle/sec on first introduction into the test situation. During T-maze discriminative performances, hippocampal theta waves regularize at 6 cyclesec. Orienting behavior is associated with slower and less regular computed averages at 4 to 5 cycle/sec. Single doses of LSD-25 are followed by prolonged disinhibition of inhibited orienting behavior and by the gradual appearance of a regular EEG average during orientations 5 to 10 days after the drug. Similar results are obtained with CL-400. It is concluded that within a single brain system, there is a clear capacity for participation in related but differing behavioral responses, with induction of greatly differing EEG patterns in discriminative and orienting responses. The possible relation of these wave patterns to the establishment of a behavioral set is discussed. (Author)

AD-626 543 Fld. 6/5
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
A NEW SERUM FACTOR IN NORMAL RABBITS. I. IDENTIFICATION AND CHARACTERIZATION,
by William J. Mandy, H. Hugh Fudenberg, and F. Bruce Lewis. 5 Feb 65, 10p. Contract Nonr-3656 (12) Grant ,PHS-H-5997 Proj. NR-105-308

Unclassified report

Availability: Published in Journal of Immunology v95 n3 p501-9 1965. Copies to DDC users only.

Descriptors: (*Rabbits, Immune serums), (*Gamma globulin, Antigens + antibodies), (*Erythrocytes, Antigen-antibody reactions), Blood serum, Papain, Chromatographic analysis, Electrophoresis, Genetics, Immunology

The sera of 36 normal rabbits reacted specifically with the univalent 3.5 S fragments produced by papain digestion of rabbit gamma-globulin. The reaction was demonstrated by the agglutination of human red cells sensitized by the univalent fragments of rabbit antihuman erythrocyte antibody. The activity of the serum factor was inhibited by the 3.5 S univalent fragments of normal rabbit gammaglobulin. The data suggest that the reactive factor, herein termed homoreactant, is one of a number of serologically distinct anti-gamma-globulin factors. The factor was shown to reside in the 7 S gamma-globulin fraction of serum, to be nondialyzable, and heat- and mercaptoethanol-resistant. The data further suggest that papain digestion of rabbit gamma-globulin reveals a buried antigenic group; this group may be related to the genetically determined antigenic groups of rabbit gamma-globulin (allotypes). Differences between homoreactant and other serum factors are discussed. (Author)

AD-626 544 Fld. 6/5
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
RHEUMATOID FACTORS AND THE ETIOLOGY OF RHEUMATOID ARTHRITIS,
by H. Hugh Fudenberg, and E. C. Franklin. 1965, 13p. Contract Nonr-3656 (12) Grant ,PHS-H-5997 Proj. NR-105-308

Unclassified report

Availability: Published in Annals of the New York Academy of Sciences v124 pt2 p884-95 Jun 30 1965. Copies to DDC users only.

Descriptors: (*Rheumatic diseases, Etiology), (*Genetics, Rheumatic diseases), Antigens + antibodies, Gamma globulin, Immune serums, Serodiagnosis, Agglutinins, Immunity, Pathology

Isospecificity of rheumatoid factors has been documented by serologic and family studies. Autospecificity can occur, but isospecificity also occurs and indeed may be more frequent. It is possible that these factors may be protective rather than pathogenic. Family studies demonstrate a high incidence of rheumatoid factors in asymptomatic relatives of patients with one or another of the diseases of immunologic aberration. The data obtained in such serologic studies may aid in the early discovery of individuals prone to develop immunologic disease on exposure to certain trigger mechanisms, whether drugs, microorganisms, or environmental agents. (Author)

AD-626 561 Fld. 6/5
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
AGAMMAGLOBULINEMIA: SOME CURRENT CONCEPTS,
by H. Hugh Fudenberg, and Kurt Hirschhorn.

1965, 20p. Contract Nonr-3656 (12) Grant, PHS-H-5997 Proj. NR-105-308

Unclassified report

Availability: Published in The Medical Clinics of North America v49 n6 p1533-52 Nov 1965. Copies to DDC users only.

Descriptors: (*Deficiency diseases, Gammaglobulin), (*Gamma-globulin, Deficiency diseases), Genetics, Anomalies, Antigens + antibodies, Proteins, Lymphocytes, In vitro analysis, Agglutins, Morphology (Biology), Toxins + antitioxins, Mutations

'Idiopathic' agammaglobulinemia, whether 'acquired' or 'congenital,' appears to be genetically determined. In 'typical' agammaglobulinemia, all three immune globulins are markedly reduced, whereas in the 'atypical' variety, one or two of the immune globulins are present in normal or increased amounts. Recent studies dealing with the human genetic gamma-globulin groups with the structure of the immune globulins, and with the production of gamma-globulin by lymphoid cells in vitro may be pertinent in elucidating the mechanisms responsible for the energy for the etiology and pathogenesis of the agammaglobulinemic state. (Author)

AD-626 569 Fld. 6/5
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF HYGIENE AND PUBLIC HEALTH
EFFECT OF INTERSTITIAL PRESSURE OF THE LUNG ON PULMONARY CIRCULATION,
by S. Permutt. 1965, 15p. Contract Nonr-248 (62) Grant ,PHS-H-1929

Unclassified report

Prepared for presentation at Conf. Res. in Emphysema (7th), Aspen, 1964.

Availability: Published in Medicina Thoracalis v22 p118-31 1965. Copies to DDC users only.

Descriptors: (*Lungs, Blood circulation), Mathematical models, Elasticity, Blood vessels, Pressure, Biophysics

The blood vessels of the lung can be divided into two types: 1. those that are exposed to alveolar pressure, the alveolar vessels, and 2. those that are not exposed to alveolar pressure, the extraalveolar vessels. The extraalveolar vessels are surrounded by a pressure which is negative relative to pleural pressure in the inflated lung, and the degree of this negative pressure increases with lung volume and static transpulmonary pressure. Under conditions where smooth muscle tone within extraalveolar vessels in minimal or absent, the principal resistance to blood flow through the lung resides within the alveolar vessels, but in the presence of smooth muscle tone within the arterial extraalveolar vessels, a critical closing pressure can develop causing the rate of blood flow to be determined by the difference between the arterial pressure and the critical closing pressure. The negative pressure surrounding the arterial extraalveolar vessels acts in opposition to the smooth muscle tone, and the development of a critical closing pressure within the arterial extraalveolar vessels depends on the balance between the smooth muscle tone within these vessels and the negative pressure surrounding them. (Author)

AD-626 625 Fld. 6/5
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
A COMMUNICATION SYSTEM FOR THE HANDICAPPED.
Technical note,
by O. Z. Ray. 31 Dec 64, 4p.
NRC 8684

Unclassified report

Availability: Published in Medical Electronics and Biological Engineering v3 p427-9 1965. Copies to DDC users only.

Descriptors: (*Medical equipment, Communication systems), (*Communication systems, Medical equipment), Paralysis, Electronic equipment, Social communication

The instrument described is an attempt to aid a severely handicapped individual communicate with those around him. It was designed to be as operationally simple as possible and to fully utilize the capabilities of one particular individual. (Author)

AD-625 848 **See Fld. 6/1**

AD-625 865 **See Fld. 6/15**

AD-625 955 **See Fld. 6/1**

AD-625 995 **See Fld. 6/15**

AD-626 004 **See Fld. 6/1**

AD-626 121 **See Fld. 6/18**

AD-626 122 **See Fld. 6/18**

AD-626 476 **See Fld. 6/13**

AD-626 559 **See Fld. 6/1**

AD-626 562 **See Fld. 6/1**

6/6. ENVIRONMENTAL BIOLOGY

AD-626 626 Fld. 6/6, 6/15
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
ANTIFUNGAL ACTIVITY OF THIOSEMICARBAZONES,
by B. A. Gingras, G. Colin, and C. H. Bayley. 2 Jul 65, 3p.
NRC 8673

Unclassified report

Availability: Published in Journal of Pharmaceutical Sciences v54 n11 p1674-5 Nov 1965. Copies to DDC users only.

Descriptors: (*Organic sulfur compounds, Fungicides), (*Organic nitorgen compounds, Fungicides), (*Fungicides, Effectiveness), Thiourea, Copper compounds, Complex compounds, Culture media, Canada

The antifungal activity of several substituted thiosemicarbazones was studied, and a direct relation was found between antifungal activity and reaction of the thiosemicarbazones with copper ions. N2-Methyl derivatives do not form complexes with copper ions and have little antifungal activity, while the other derivatives for which complex formation is possible have an activity similar to that of the unsubstituted thiosemicarbazones. 9-Undecenal thiosemicarbazone was found to be active against Aspergillus niger in a metal-deficient medium, but its effect can be neutralized by the addition of equivalent amounts of copper acetate. (Author)

AD-626 567 **See Fld. 8/6**

6/8. FOOD

AD-626 050 Fld. 6/8
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
NUTRITIONAL AND MEDICINAL QUALITIES OF THE BULGARIAN PEPPER,
by Tavo Tashev. Dec 65, 4p. Rept. no. FSTC-381-T65-613
TT 66-60179

Unclassified report

Trans. of Priroda (USSR) n8 p119-20 1965.

Descriptors: (*Vegetables, Bulgaria), (*Nutrition, Vegetables), Food, USSR, Plants (Botany)

AD-626 068 Fld. 6/8, 7/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
THE ANTIOXIDIZING ACTION OF SMOKING FLUIDS,
by V. I. Kurko, and E. A. Khmelnitskii. Dec 65, 7p. Rept. no. FSTC-381-T65-610
TT 66-60187

Unclassified report

Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n4 (47) p44-6 1965.

Descriptors: (*Meat, Preservation), (*Fats, Antioxidants), (*Antioxidants, Chemical properties), Smokes, Effectiveness, Phenols, USSR

Ether extracts of the several meat smoking fluids investigated do comparatively little to prevent the spoiling of fat by oxidation. When the amount is increased to 4%, the antioxidizing effect is more pronounced. Differences in the phenol composition of the smoking fluids investigated consist in the absence or comparatively low content of monovalent and very simple bivalent phenols in MINKh fluid. Pyrocatechol, 3-methyl pyrocatechol, 4-methyl pyrocatechol, and especially pyrogallol possess the most marked antioxidizing properties. (Author)

AD-626 176 Fld. 6/8
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
THE ROLE OF AMINO CARBOXYLIC COMPOUNDS AS OXIDATION INHIBITORS IN DEHYDRATED SYSTEMS.
Final rept. 13 Apr 64-13 Apr 65,
by M. Karel, and S. Tannenbaum. Dec 65, 90p. Contract DA-19-129-AMC-254 (N) Proj. DA-1K012501A034
USA-NLABS FD-36

Unclassified report

Descriptors: (*Dehydrated foods, Antioxidants), Oxidation, Linoleic acid, Freeze drying, Amines, Military rations, Stability, Identification, Separation, Tables, Acceptability

Oxidation of methyl linoleate was studied in a freezedried model system based on microcrystalline cellulose, in the presence and in the absence of amino carboxylic compounds added in concentrations ranging from .001 to .04 moles per mole of linoleate. It was observed that several amino carboxylic compounds had substantial antioxidant activity. Compounds for which such activity was observed included: histidine, cysteine, alanine, lysine, beta amino butyric acid, gamma amino butyric acid, and epsilon amino caproic acid; whereas no antioxidant activity was obseved with methionine, arginine, phenylalanine and isoleucine. The nature of the antioxidant activity of the amino compounds was found to be different from that observed in the identical system with a phenolic antioxidant, since the main effect of the amino compound was to prolong the induction period, but the phenolic compound prolonged the induction period, and in addition reduced the rate of oxidation throughout the course of oxidation. Work was undertaken on the separation and characterization of reaction products from model systems containing linoleate and amino compounds. Reaction products in the model system oxidized in the presence of linoleate and histidine were studied using radioactive tracer compounds.

AD-626 178 Fld. 6/8
CFSTI Prices: HC $2.00 MF $0.50
VISKING CO CHICAGO ILL
STORAGE LIFE OF FROZEN FRANKFURTERS.
Final rept. no. 4, 31 May 61-30 Jun 63,
by S. Simon, D. Dieball, W. Kramlich, and R. Yotter. Nov 65, 36p. Contract DA-19-129-QM-1790 Proj. DA-2210.8
USA-NLABS FD-34

Unclassified report

Descriptors: (*Meat, Frozen foods), (*Frozen foods, Storage), Stability, Acceptability, Military rations, Reduction, Oxidizers, Barbiturates, Tests, Ultraviolet radiation

Frankfurters prepared in accordance with standard commercial formulations and processes simulated the rancidity pattern observed under field conditions. Some experimental lots were evaluated as rancid after 2 to 3 months storage at 0 to -10F; other lots were found to be free of rancidity after 6 months. Experiments involving the use of prooxidants or exposure to ultraviolet radiation showed no promise of differentiating between frankfurters undergoing rapid and slow oxidative changes during frozen storage. Observations were performed on the suitability of the thiobarbituric acid (TBA) test and on the determination of volatile reducing substances (VRS) to the identification of frankfurters predisposed to rapid development of rancidity. Neither of these tests, even when used in conjunction with accelerated storage conditions, was found suitable for predicting the onset of rancidity during frozen storage. (Author)

AD-626 193 Fld. 6/8
CFSTI Prices: HC $3.00 MF $0.75
FMC CORP SANTA CLARA CALIF CENTRAL ENGINEERING LABS
ULTRA-HIGH COMPRESSION OF DRIED FOODS.
Final rept. for 20 Apr 64,
by R. A. Lampi, H. Takahashi, J. Lennon, R. F. Batteyand , and S. Sierra. Nov 65, 64p. Contract DA-19-129-AMC-163 (N) Proj. DA-7X84-06-033
USA-NLABS FD-35

Unclassified report

Descriptors: (*Dehydrated foods, Compressive properties), Temperature, Pressure, Military rations, Taste, Fragmentation, Dies, Sorption, Chemical analysis, Tables

The report covers the study of the effects of pressures as high as 120,000 psi on various dried foods. High compression did not produce any detectable chemical changes. Compressed foods became difficult to rehydrate and exhibited considerable fragmentation when hydrated. Temperature changes occuring during high compression operations were studied. The equipment used for achieving high pressures and the construction of the die are discussed. (Author)

AD-626 210 Fld. 6/8
CFSTI Prices: HC $2.00 MF $0.50
IONICS INC WATERTOWN · MASS RESEARCH DIV
ADVANCED STUDY OF MILK DECONTAMINATION BY ELECTRODIALYSIS.
Final rept. Jul 64-May 65,
by John L. Greatorex, and Werner Glass. Oct 65, 32p. Contract OCD-PS-64-281

Unclassified report

Descriptors: (*Milk, Decontamination), Electrodialysis, Strontium, Radioactive isotopes, Radiological contamination, Cesium, Ions, Membranes, Cleaning

A five gph electrodialytic milk decontamination test plant decontamination test plant was built and operated. Parameters studies were membrane life, effect of time on current efficiency and cleaning technique. After the initial debugging expected with any test plant, operability was excellent. Approximately 8,000 lbs of milk were treated. Removal of radioactive Sr-90 and Cs-137 averaged 90%. The ion-selective membranes showed no decrement in performance following an initial drop from 90% current efficiency to 82% during the first 60 hours of operation. A suitable in situ method of cleaning the membrane stack was developed: consecutive rinses of water, 5% NaOH, warm (150F) water, 5% HCl and water. The chemical costs of this cleaning method come to about 0.03 cent/gallon milk. Bacteria counts always remained below the 50,000 per ml USPHS standard. (Author)

AD-626 641 Fld. 6/8
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
OBJECTIVE EVALUATION OF QUALITY IN POULTRY MEAT,
by A. W. Khan. 1965, 3p.
NRC 8573

Unclassified report

Availability: Published in Nature v208 n5006 p204-5 Oct 9, 1965. Copies to DDC users only.

Descriptors: (*Chickens, Frozen foods), Acceptability, Tissues (Biology), Proteins, Muscles, Odors, Quality control, Degradation

AD-626 646 Fld. 6/8
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
INFLUENCE OF PRERIGOR, RIGOR AND POSTRIGOR FREEZING ON DRIP LOSSES AND PROTEIN CHANGES IN CHICKEN MEAT,
by A. W. Khan, and C. P. Lentz. 1965, 4p.
NRC 8703

Unclassified report

Availability: Published in Journal of Food Science v30 n5 p787-90 Sep-Oct 1965. Copies to DDC users only.

Descriptors: (*Chickens, Frozen foods), (*Frozen foods, Chickens), Nitrogen, Ribose, Proteins, Muscles, Tissues (Biology), Water, Acceptability, Canada

Tests made with chickens frozen before rigor, during rigor, and after rigor showed that the amount of drip exuded on thawing was greatest in poultry frozen during rigor. The loss of nitrogenous constituents and ribose increased proportionally with the amount of drip. Protein solubility was minimum, and cooking losses maximum, in poultry frozen during rigor. The factors responsible for drip loss in poultry appear to be similar, regardless of the stage of rigor mortis at which the meat was frozen. It is probable that more water froze out of muscle during the state of rigor, causing higher solute concentrations in the tissue. The higher solute concentration in the muscle tissue frozen during rigor may affect the solubility of proteins and their ability to reabsorb water on thawing, and thus affect tenderness and loss of drip. (Author)

AD-626 320 **See Fld. 6/18**

6/11. LIFE SUPPORT

AD-626 588 Fld. 6/11, 13/10
CFSTI Prices: HC $1.00 MF $0.50
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD
DEVELOPMENT OF AN IMPROVED PROCESS FOR THE CATALYTIC OXIDATION OF ATMOSPHERIC CONTAMINANTS IN SUBMARINES.
Research and development rept.,
by W. R. Calvert. Jan 66, 25p. Rept. no. mel-449/65
Proj. S-F013-08-03 Task 4095

Unclassified report

Descriptors: (*Submarines, Life support), (*Life support, Submarines), (*Air, Purification), Air pollution, Oxidation, Impurities, Catalysts, Halogenated hydrocarbons, Adsorbtion

Studies in the development of an improved catalytic oxidation process reveal that polluted air causes other problems along with the corrosion which has been experienced in submarines. CO/H2 Burner troubles are explained by data showing inhibition of Hopcalite due to adsorption of CO2 and organic halides and showing catalyst granules turning to dust because of thermal fracture. Minimization of air pollutants is necessary, and preprocessing to remove certain materials before the catalytic oxidation is a necessary part of air purification. (Author)

AD-626 596 Fld. 6/11, 7/2, 22/2
CFSTI Prices: HC $2.00 MF $0.50
IIT RESEARCH INST CHICAGO ILL
THERMODYNAMIC EVALUATION OF THE POSSIBILITY OF LITHIUM SUPEROXIDE PRODUCTION.
Final rept. 1 Feb-29 May 65,
by Richard H. Snow. Aug 65, 34p. Rept. no. IITRI-C6057-4
Contract AF33 (615)-2351 Proj. AF-6373 Task 637302
AMRL TR-65-126

Unclassified report

Descriptors: (*Lithium compounds, Closed ecological conditions), (*Closed ecological conditions, Lithium compounds), Oxides, Peroxides, Thermodynamics, Thermochemistry, Air, Regeneration, Respiration, Stability, Entropy, Heat of formation, Crystal structure, Spacecraft, Life support, Alkali metal compounds, Production

To determine whether lithium superoxide can be produced and whether it is stable enough for use in air regeneration units of manned spacecraft, the free energy of lithium superoxide was calculated from estimated values of the heat of formation, entropy, and heat capacity. The estimates were based on graphical comparison with properties of other oxides. The heat of formation was also determined from calculation of the lattice energy by means of the Born-Haber cycle. The result was -65 kcal. The stability of lithium superoxide was deduced by comparing graphically the free energies of the oxides of lithium. The superoxide is unstable by 15 kcal from 100 to 300K and is even more unstable at higher temperatures. Reasonably high pressure and other effects cannot overcome this instability, even at low temperature. Therefore the use of lithium superoxide for air regeneration units is not promising. (Author)

AD-626 619 Fld. 6/11, 6/17
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
BIOCHEMICAL AND PHYSIOLOGICAL EVALUATION OF HUMAN SUBJECTS WEARING PRESSURE SUITS UNDER SIMULATED AEROSPACE CONDITIONS.
Final rept.,
by K. J. Smith, E. W. Speckmann, Marilyn E. George, G. M. Homer, and D. Wiltsie Dunco. Oct 65, 50p. Rept. no. AMRL-TR-65-147
Proj. AF-7164 Task 716405

Unclassified report

Descriptors: (*Diet, Space medicine), (*Pressure suits, Space medicine), Astronauts, Aviation personnel, Aviation medicine, Nutrition, Physiology, Blood pressure, Body temperature, Pulse rate, Hematology, Blood chemistry, Metabolism, Exercise, Confined environments, Life support

A series of experiments has been designed to determine the water, energy, and protein requirements of man under various simulated aerospace

conditions. The experiment described measured the effects of wearing a MA-10 pressure suit continuously for 14 days on the aforementioned measurements. A freshly prepared diet that closely matched proposed aerospace diets was fed to four human volunteers and coefficients of apparent digestibility and balances of the component nutrients were determined. The results showed that the wearing of unpressurized MA-10 suits under ambient conditions for 14 days did not affect the subjects' fluid intake and output. No significant changes were observed in digestibilities or balances of the nutrient components. Results indicated that the fresh food diets was very efficiently utilized. No significant changes in subject blood pressures, oral temperatures or pulse rates were observed during the experiment. All hematological and chemical analyses of blood were within the normal range and did not exhibit differences between experimental periods. The 2 day menu of fresh foods proved to be very acceptable and did not decrease in acceptability during the 42 day experiment. (Author)

6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

AD-625 811 Fld. 6/12, 6/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY MEDICAL BIOMECHANICAL RESEARCH LAB WALTER REED ARMY MEDICAL CENTER WASHINGTON D C
DEVELOPMENT OF AN ACRYLATE NIPPLE FOR SMALL ANIMALS.
Technical rept.,
by Carl Nielson. Oct 65, 17p. Rept. no. TR-6519
Proj. DA-3A025601A821-01
Unclassified report

Descriptors: (*Laboratory equipment, Germ-free animals), (*Germ-free animals, Laboratory equipment), Manufacturing methods, Acrylic resins, Food, Biological laboratories

A new device is presented for the feeding of small newborn animals under germ-free conditions. Materials of construction and methodology are given in detail. (Author)

6/13. MICROBIOLOGY

AD-626 042 Fld. 6/13
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
PROTEASE PRODUCTION BY ALTERNARIA TENUISSIMA,
by A. G. Jonsson, and S. M. Martin. 13 Feb 65, 5p.
NRC 8648
Unclassified report

Availability: Published in Agriculture, Biology and Chemistry, v29 n9 p787-91 1965. Copies to DDC users only.

Descriptors: (*Peptide hydrolases, Molds (Organisms)), (*Molds (Organisms), Peptide hydrolases), Production, Purification, Culture media, pH, Canada

Five strains of A. tenuissima showed wide variation in ability to produce extracellular proteases and the amount of protease produced by a given strain varied greatly with the medium used. Strain E-34 produced at least three proteases, with pH optima for casein digestion of pH 2.8, 6.6 and 9.5 respectively. The effect of the constituents of a liver-glucose medium on production of pH 9.5 protease by strain E-34 was investigated. Yields of pH 9.5 protease of up to 1.4 enzyme units per l have been obtained using this strain. (Author)

AD-626 054 Fld. 6/13
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
MORPHOMETRIC ANALYSIS OF YEAST CELLS. ADULT CELL VOLUME OF SACCHAROMYCES CEREVISIAE,
by B. F. Johnson. 29 Jan 65, 8p.
Unclassified report

Availability: Published in Experimental Cell Research v39 p577-83 1965. Copies to DDC users only.

Descriptors: (*Yeasts, Morphology (Biology)), (*Sacchromyces, Life cycle), Measurement, Growth, Culture media, Volume, Adults, Canada

The volume of adult baker's yeast cells varies appreciably (from ca 350 cubic microns to ca 230 cubic microns) through the budding cycle. Most of the decrease in volume occurs in the first few moments after bud initiation. The volume does not begin to increase until the bud is 5 microns long. This loss of volume is not compensated for by the increase in bud volume, i.e., the system--paternal cell plus new bud--occupies less space than did the adult before bud initiation. The wall is apparently equally elastic in all directions, for no change in the L/W ratio was detectable. (Author)

AD-626 115 Fld. 6/13, 6/1
ILLINOIS UNIV URBANA DEPT OF MICROBIOLOGY
BIOCHEMICAL CHANGES IN LYSOGENIC BACILLUS STEAROTHERMOPHILUS AFTER BACTERIOPHAGE INDUCTION,
by N. E. Welker, and L. Leon Campbell. 9 Jun 65, 10p. Contract NSF-GB-4 Proj. NR-108-330
Unclassified report

Presented at the Annual Meeting of the American Society for Microbiology, (65th), Atlantic City, N. J., 25-29 Apr 1965.

Availability: Published in Journal of Bacteriology, v90 n4 p1129-37 Oct 1965. Copies to DDC users only.

Descriptors: (*Bacillus, Biochemistry), (*Bacteriophages, Nucleic acids), (*Nucleic acids, Synthesis), Culture media, Ribonucleic acids, Desoxyribonucleic acids, Proteins, Inhibition, Glycoside hydrolases, Ultraviolet radiation

Cultures of Bacillus stearothermophilus 1503-4R (TP-1) continued to grow at an unaltered rate after induction with mitomycin C (MC). MC-induced cultures exhibited a 2.5-fold increase in cell number before lysis occurred. Prior to lysis, cells were observed to elongate and to contain areas of lesser density. Protein synthesis was slightly inhibited in MC- or ultraviolet light (UV)induced cultures for a period of 5 to 10 min, and then proceeded at a rate identical to that in the noninduced culture. Ribonucleic acid (RNA) synthesis was not affected by MC induction. UV induction caused RNA synthesis to occur in two stages: in the first stage, the rate of RNA synthesis was one-third that observed in the noninduced culture and lasted for a period of 15 min; the second stage of RNA synthesis then proceeded at a rate identical to that in the noninduced culture. The synthesis of deoxyribonucleic acid (DNA) in an MC- or UV-induced culture occurred in two stages. In the first stage, DNA synthesis in induced cultures occurred at a rate of onehalf (MC) and one-third (UV) of that observed in the noninduced culture. The first stage of DNA synthesis in MCor UV-induced cultures lasted for 25 to 30 min and 15 to 20 min, respectively. (Author)

AD-626 277 Fld. 6/13
CFSTI Prices: HC $5.00 MF $1.00
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
TISSUE CULTURES IN VIROLOGY,
by V. D. Solovev, and T. A. Bektemirov. Nov 65, 149p. Rept. no. ACSI-1-4526
TT 66-60226
Unclassified report

Trans. of mono. Tkanevye Kultury v Virusologii, Moscow, 1963 198p.

Descriptors: (*Tissue culture, Viruses), (*Viruses, Tissue culture), Tissue culture cells, Nutrition, Antibiotics, Body fluids, Blood serum, Embryonated egg technique, Culture media, Antigens + antibodies, Laboratory equipment, USSR

AD-626 476 Fld. 6/13, 6/5
CFSTI Prices: HC $3.00 MF $0.75
INSTITUTE OF CONTEMPORARY RUSSIAN STUDIES FORDHAM UNIV NEW YORK
SOVIET BIOMEDICAL JOURNALS: SELECTED ABSTRACTS, SERIES III, NO. 3,
by Robert Pollitzer. Aug 65, 100p. Contract DA-18-064-AMC-375 (A)
TT 66-60260
Unclassified report

Index to direct translations and/or abstracts of Russian open literature. See also AD-610 381.

Descriptors: (*Microbiology, Reviews), (*Epidemiology, Reviews), (*Parasites, Reviews), Parasitic diseases, Biology, Medicine, Bibliographies, Abstracts, USSR

AD-625 665 **See Fld. 6/5**

AD-625 943 **See Fld. 6/5**

AD-625 951 **See Fld. 6/15**

AD-626 022 **See Fld. 6/5**

AD-626 085 **See Fld. 14/2**

6/14. PERSONNEL SELECTION AND MAINTENANCE (MEDICAL)

AD-625 854 Fld. 6/14, 5/9
CFSTI Prices: HC $5.00 MF $1.00
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THOUSAND AVIATOR STUDY: METHODOLOGY,
by Albert Oberman, Robert E. Mitchell, and Ashton Graybiel. 22 Jul 65, 168p. Rept. no. Monograph-11
Unclassified report

Prepared in cooperation with U. S. Public Health Service and National Aeronautics and Space Administration, NASA Order-R-136.

Descriptors: (*Medical examination, Naval personnel), (*Naval personnel, Selection), (*Aviation personnel, Selection), Psychometrics, Training, Anthropometry, Vision, Audiometry, Neurology, Aviation medicine

The Pensacola study of Naval Aviators, commonly termed the 'Thousand Aviator Study,' began in July 1940 as a survey to validate techniques for pre-selecting pilot trainees in order to reduce the large attrition rate in the flight training program at that time. From this original exploratory study of pilot selection evolved a longitudddinal study which has provided continuous physiollogic information on a group of healthy males from youth to senescence. Reexaminations have been made on survivors of the group in 1951, 1957, and 1963. The monograph purports to accomplish the following aims: (1) Present and unify the procedures and methods of all the examinations carried out on the group, (2) offer standard material for cooperative studies, (3) serve as a guide for future evaluations,

(4) display the methodology employed in a fashion which lends itself to perusal by critical reviewers, (5) suggest by retrospection necessary modifications, and (6) provide a basis for scrutinizing the material in search of new avenues of investigation. (Author)

AD-626 322 Fld. 6/14
CFSTI Prices: HC $4.00 MF $0.75
NAVAL AIR ENGINEERING CENTER PHILADELPHIA PA AEROSPACE CREW EQUIPMENT LAB
ANTHROPOMETRY OF NAVAL AVIATORS. 1964,
by Edmund C. Gifford, Joseph R. Provost, and John Lazo. 8 Oct 65, 114p. Rept. no. NAEC-ACEL-533
Task RAE-13C-005/2001/R005-01-01
NAVMED MR005.13-9040.1
Unclassified report

Descriptors: (*Anthropometry, Aviation personnel), (*Aviation personnel, Anthropometry), Naval personnel, Protective clothing, Safety devices, Body, Measurement, Design, Statistical data, Tables

Body size data for 96 measurements of 1,549 U.S. naval aviators are presented. The techniques of measurement are illustrated by schematic drawings and reference to the literature. Both diametral and surface measurements are included. Dimensions are given in both centimeters and inches. Statistics included are percentiles, means, standard deviations, and coefficients of variation. These data are presented for use by designers of aircraft workspaces and designers of personnel protective clothing and equipment. (Author)

6/15. PHARMACOLOGY

AD-625 835 Fld. 6/15
CFSTI Prices: HC $1.00 MF $0.50
KEIO UNIV TOKYO (JAPAN) SCHOOL OF MEDICINE
TREATMENT OF TOXOPLASMOSIS.
Quarterly rept. no. 3, 15 Apr-14 Jul 62,
by Hisakichi Matsubayashi. 14 Jul 62, 8p. Contract DA-92-557-FEC-35637
Unclassified report

Descriptors: (*Toxoplasma, Chemotherapeutic agents), (*Chemotherapeutic agaagents, Toxoplasma), Diseases, Drugs, Dosage, Pyrimidines, Guanidines, Mice, Injection (Medicine), Japan

Screening tests of various kinds of compounds were continuously carried out on the purpose of obtaining new drugs for Toxoplasmosis. The methods of tests were quite the same as reported previously (firstsst annaandnd second reports). Comounds tested were 18 pyrimidine derivatives, 8 guanidine derivatives and 4 sulfone derivatives.

AD-625 865 Fld. 6/15, 6/5
CFSTI Prices: HC $2.00 MF $0.50
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
PRACTICAL AND THEORETICAL IMPLICATIONS BASED ON LONG-TERM FOLLOW-UP OF MENIERE'S PATIENTS TREATED WITH STREPTOMYCIN SULFATE,
by Ashton Graybiel, Harold F. Schuknecht, Alfred R.Fregly, Earl F. Miller,II, and Michael E. McLeod. 25 Oct 65, 26p. Rept. no. NAMI-948
Contract nasa order-R-93
NAVMED MR005.13-6001.1 23
Unclassified report

Descriptors: (*Deafness, Streptomycins), (*Streptomycins, Hearing), (*Ear, Diseases), Sulfates, Vestibular apparatus, Semicircular canals, Audiometry, Etiology, Therapy, Toxicity, Motion sickness, Perception, Equilibrium

Four patients who had received streptomycin sulfate in the treatment of Meniere's disease were evaluated in terms of the long-range effects of therapy and utilized as experimental subjects. The findings are reported in terms of a lack of return of their symptoms, and the effect of the drug on hearing, the semicircular canals, otolith organs, ataxia, and the Coriolis oculogyral illusion. An attempt was made to interpret the findings in terms of the etiology of idiopathic Meniere's disease, and the suggestion is made that it might represent a disturbance attributable to the secretory cells of the crista. (Author)

AD-625 941 Fld. 6/15, 6/1
CFSTI Prices: HC $2.00 MF $0.50
TOKYO NATIONAL CHEST HOSPITAL (JAPAN)
BIOCHEMICAL AND GENETICAL STUDIES ON INH METABOLISM.
Semi-annual rept. 2 Jun-1 Dec 64,
by chigeichi Sunahara. 1 Dec 64, 26p. Contract DA-CRD-AG-S92-544-64-G20
ARDG (FE) J-197
Unclassified report

Descriptors: (*Isoniazid, Metabolism), Genetics, In vitro analysis, Blood chemistry, Tissues (Biology), Liver, Monkeys, Japan

It was established that the inactivation of isoniazid in humans was a genetic trait and there was not only individual but also racial difference. The frequency distribution curve of the biologically active isoniazid serum levels 6 hours after the oral administration of 4 mg/kg of body weight of isonizzid is trimodal, corresponding to the three phenotypes of isoniazid metabolism--rapid, intermediate and slow inactivators. On the other hand, it was observed in vitro that there was very remarkable species and drug differences in the acetylation of isoniazid, sulfonamide and PABA by the liver homogenate of various kinds of animals, and the most active site of acetylation was the liver. The purpose of the present research is to examine the correlation between the blood concentration and the capacity of tissue to acetylate isoniazid using Cynomoldus monkeys as animals of experiment.

AD-625 951 Fld. 6/15, 6/13
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTE OF MICROBIAL CHEMISTRY TOKYO (JAPAN)
EPIDEMIOLOGICAL AND GENETICAL STUDY ON THE DRUG-RESISTANCE OF SHIGELLAE AND STAPHYLOCOCCI.
Semi-annual rept., 15 May-14 Nov 64,
by Susumu Mitsuhashi. 14 Nov 64, 5p. Contract DA-CRD-AG-S92-544-64-G19
ARDG (FE) J-183
Unclassified report

Descriptors: (*Drugs, Resistance (Biological)), (*Shigella, Antibiotics), (*Staphylococcus, Antibiotics), Genetics, Epidemiology, In vitro analysis, Chloramphenicol, Tetracyclines, Streptomycins, Penicillins, Japan

From the in-patients of 6 city hospitals, 6,000 strains of Shigella were isolated, and their bacteriological properties and drug-resistance patterns were examined. Approximately 90% of the isolated Shigella strains were resistant to sulfanilamide (SA). Among the drug-resistant Shigella strains, 78% were resistant to chloramphenicol (CM), tetracycline (TC), streptomycin (SM) and sulfanilamide (SA). A transmissible drug-resistance factor, R (CM (s)TC (s)SM (r)SA (r) was obtained from an epidemic in Tokyo. Following the administration of tetracycline, R (CM (s)TC (r)SM (r) SA (r) was obtained from the same patients. It was found by in vitro study that R (CM (s)TC (s)SM (r)SA (r) factor was converted to R (CM (s)TC (r)SM (r)SA (r) factor in high frequency on the plate containing tetracycline. From the in-patients of 14 hospitals, 1284 strains of staphylococci were isolated, and their phase typing and drug-resistance patterns were examined. Ninety-nine percent were drug-resistant. Among the resistant strains, 31% were resistant to SA, 20% to PC.SA, 17% to TC.SM.PC.SA, and 12% to TC.PC.SA. It was noted that the degree of resistance to each drug was extremely high in the multiple resistant strains.

AD-625 961 Fld. 6/15, 5/10
CFSTI Prices: HC $1.00 MF $0.50
PRIMATE LAB UNIV OF WISCONSIN MADISON
METHODS FOR MEASURING CHEMICALLY INDUCED BEHAVIORAL CHANGES IN VARIOUS MAMMALIAN SPECIES.
Quarterly rept. no. 2, 16 Aug-15 Nov 64,
by V. J. Polidora. 15 Nov 64, 5p. Contract DA-18-035-AMC-135 (A)
Unclassified report

Descriptors: (*Drugs, Behavior), (*Behavior, Mammals), Monkeys, Rats, Attention, Learning, Performance tests, Vision, Stimulation, Chlorpromazine, Amphetamines, Barbiturates

Progress is reported on the four research programs (Sequential Responses, Vigilance, Visual Exploration, and WATA) being developed to study drug effects upon animal behavior. (Author)

AD-625 995 Fld. 6/15, 6/5, 5/10
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
PHYSIOLOGIC TREATMENT OF DEPRESSIVE REACTIONS: A PILOT STUDY.
Final rept.,
by Howard D. Kurland. 1963, 5p. Rept. no. CIC-TR-16
Contract Nonr-222 (51) Proj. NR-105-156
Unclassified report

Availability: Published in The American Journal of Psychiatry v122 n4 p457-8 1965. Copies to DDC users only.

Descriptors: (*Drugs, Psychiatry), (*Psychiatry, Drugs), Mental disorders, Psychoses, Corticosteroid agents, Personality, Dosage, Diagnosis, Therapy

No treatment has yet been devised that can cure all forms of depression or even all patients with any single type of depressive reaction. This pilot study revealed that prednisone was effective in ameliorating only the components of affective disorder in neurotic- and psychoticdepressives and in schizo-affectives. Because of the marked effects in every subject, the use of sequential statistics to analyze the clinical ratings of depression yielded evidence of improvement at the 99% level of confidence with only 4 cases in each of the 3 categories. Further clinical studies of larger populations and variable treatment combinations now appear warranted. (Author)

AD-626 308 Fld. 6/15, 6/16
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
THE EFFECT OF INTRAVENOUS HISTAMINE ON THE URINARY EXCRETION OF EPINEPHRINE, NOREPINEPHRINE, AND 3-METHOXY- 4-HYDROXYMANDELIC ACID IN ESSENTIAL HYPERTENSION.
Technical rept.,
by George B. Theil, and Virginia C. Garcia. 1965, 12p. Rept. no. CIC-TR-21
Contract Nonr-222 (51) Proj. NR-105-156
NAVMED MR005.12-1408.5
Unclassified report

Prepared in cooperation with Iowa Univ., Iowa City. Coll. of Medicine and San Jose State Univ., Calif.

Availability: Published in American Journal of the Medical Sciences, v249 p654-62 Jun 1965. Copies to DDC users only.

Descriptors: (*Histamine, Excretion), (*Hypotension, Histamine), Ephinephrine, Levarterenol, Carboxylic acids, Aromatic compounds, Blood pressure

A comparison is made of the pharmacologic effect of parenteral histamine on the urinary excretion rate of epinephrine, norepinephrine and VMA, and of the blood pressure response in patients with essential hypertension and nonhypertensive control subjects. (Author)

AD-625 934 See Fld. 7/5

AD-625 953 See Fld. 6/5

AD-625 999 See Fld. 6/5

AD-626 552 See Fld. 6/3

AD-626 626 See Fld. 6/6

6/16. PHYSIOLOGY

AD-625 666 Fld. 6/16
CFSTI Prices: HC $2.00 MF $0.50
MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
THE THEORY OF URINE FORMATION IN WATER DIURESIS WITH IMPLICATIONS FOR ANTIDIURESIS.
Technical note,
by Donald J. Marsh, Robert B. Kelman, and Henry C. Howard. Nov 65, 49p. Rept. no. BN-421
Contract Nonr-595 (17) Grant PHS-AM-06864-03

Unclassified report

Descriptors: (*Kidneys, Mathematical models), (*Osmosis, Kidneys), Electrolytes (Physiology), Urine, Water, Sodium compounds, Chlorides, Transport properties, Urinary system, Permeability, Blood circulation, Differential equations

A model of the renal medulla is investigated in which active NaCl transport is restricted to thick ascending limb of Henle's loop. The model contains a vas rectum, a loop of Henle, salt, and water. The model generates interstitial osmolality curves consonant with the known functioning of the kidney in water diuresis. Using data from the white rate and the curves generated by the model, one can predict the permeability of the thin limb of Henle's loop to NaCl and the percentage of total renal blood flow entering the inner medulla. In this model interstitial osmolality at the papilla can be about twice plasma osmolality, so that NaCl transport restricted to the outer medulla can contribute significantly to the work required in producing a hypertonic urine. However, the interstitial osmolality monotonically decreases proceeding from the junction of the outer and inner medulla to the papilla, and the maximum interstitial osmolality in the outer medulla is greater than the maximum interstitial osmolality in the inner medulla. Thus it is inferred that a source of active transport located in the inner medulla is needed to explain the high osmolalities observed in hydropenia. A sketch of an alternative model, a 'lineal multiplication mechanism', for the renal concentrating process is presented in which active transport in the inner medulla is restricted to active salt transport by the collecting duct. The lineal multiplication mechanism makes no use of countercurrent multipliers in the inner medulla. (Author)

AD-625 759 Fld. 6/16, 5/2, 5/10, 6/4
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SUPERIMPOSED RANDOM CODING OF STIMULUS RESPONSE CONNECTIONS.
Professional paper,
by Peter H. Greene. 10 Nov 65, 18p. Rept. no. SP-2071/000/00
Contract Nonr-2121 (17) Proj. NR-049-148

Unclassified report

Descriptors: (*Nervous system, Coding), (*Information retrieval, Coding), Learning, Nerve cells, Reports, Punched cards, Stimulation, Reaction (Psychology), Programming (Computers)

The problem of economically linking a large number of stimuli with a large number of potential responses is considered to resemble a problem of efficient retrieval of documents (the responses) on the basis of their characterization by descriptors (the stimuli to which the responses are appropriate). In this retrieval problem, a method whereby the codes for descriptors are random positions in a coding field, and whereby codes for all applicable descriptors are superimposed in the same field, seems to be the simplest way of avoiding serious difficulties of retrieval. After a review of this method, the possibility is considered that very simple neural mechanisms could embody the essential features of the method. The aim of the discussion is to learn whether very simple structures and patterns of reinforcement would be adequate to carry out useful information processing in the brain, and to show some conceivable functions of simple neural networks that the experimenter might keep in mind. The discussion also shows how the structure of a simple 'perceptron-like' network is suggested by the requirements of a retrieval task. (Author)

AD-625 841 Fld. 6/16
CFSTI Prices: HC $1.00 MF $0.50
HIROSHIMA UNIV (JAPAN) SCHOOL OF MEDICINE
MECHANISMS OF SMOOTH MUSCLE RELAXATION THROUGH THE ANODAL CURRENT STIMULATION.
Semiannual rept. 30 Jul 63-29 Jan 64,
by Hiroshi Irisawa. 29 Jan 64, 6p. Contract DA-92-557-FEC-36882
ARDG J-173

Unclassified report

Descriptors: (*Muscles, Relaxation (Physiology)), (*Urinary system, Electrophysiology), (*Electrophysiology, Muscles), Electric currents, Stimulation, Mammals, Amphibians, Temperature, Sodium, Deficiency diseases, Heart, Autonomic nervous system, Japan

The intracellular action potential of the mammalian ureter was studied to solve the following questions. (a) Whether repolarization phase can be superimposed. (b) Whether the response to the ion concentration of extracellular bathing fluid differ from each other. (c) The response of chemical substances such as autonomic-neuroeffectors.

AD-625 849 Fld. 6/16, 6/1
NARA MEDICAL COLL KASHIHARA CITY (JAPAN) DEPT OF PHYSIOLOGY
STUDIES ON THE HEMOGLOBIN-OXYGEN EQUILIBRIUM.
Semiannual abstract rept. 18 Jun-17 Dec 64,
by Itiro Tyuma. 17 Dec 64, 18p. Contract DA-92-557-FEC-37427
ARDG (FE) J-207

Unclassified report

See also AD-624 740.

Descriptors: (*Genetics, Hemoglobin), (*Hemoglobin, Equilibrium), Oxygen, Spectroscopy, Chromatographic analysis, Electrophoresis, Oxidation, Organic pigments, Humans, Dogs, Rats, Japan

Whole blood and hemolysate from a hemoglobin M (O) heterozygote showed a lower oxygen affinity than normal adult blood and hemolysate. A decreased heme-heme interaction was also observed in the hemolysate from the patient. Extent of hybridization between human adult and canine hemoglobins decreased with the decrease of oxygen saturation of the pigments. A rough rectangular hyperbolic relation was noticed between the extent of hybridization and the degree of oxygenation. Heterogenous feature of chromaiographic fractions of rat hemoglobin was revealed on the starch-gel electrophoretic analysis of them. A simple and efficient apparatus was developed for concentrating any dilute macromolecule solution. (Author)

AD-625 857 Fld. 6/16
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
THE ROLE OF ELECTROMAGNETIC FIELDS IN PHYSIOLOGICAL PROCESSES,
by A. S. Presman. Dec 65, 9p. Rept. no. fstc-381-T65-601
TT 66-60160

Unclassified report

Trans. of Biofizika (USSR) v9 n1 p131-4 1964.

Descriptors: (*Electromagnetic fields, Physiology), (*Physiology, Electromagnetic fields), Biophysics, Nervous system, Growth, Proteins, Tissues (Biology), Electrophysiology, USSR

An attempt is made to analyze certain data on the specific effect of electromagnetic fields on the nervous system, tissue growth and development, on the state of protein molecules, and on the generation of electromagnetic fields in the tissues of living organisms.

AD-625 909 Fld. 6/16, 5/10, 6/3
CFSTI Prices: HC $2.00 MF $0.50
FLORIDA STATE UNIV TALLAHASSEE
EARLY DARK ADAPTATION IN LIMULUS POLYPHEMUS.
Technical rept.,
by Knox E. Miller Jr. 1965, 29p. Contract Nonr-558 (00) Proj. NR-140-036

Unclassified report

Descriptors: (*Vision, Adaptation (Physiology)), Thresholds (Physiology), Nerve cells, Retina, Photoreceptors, Stimulation, Electrophysiology, Nerve impulses, Optic nerve, Eye, Psychophysiology, Arthropods

The present study is designed to measure the response of relatively isolated photoreceptor units under experimental conditions comparable to those found in psychophysical investigations of human early dark adaptation. The term 'relatively isolated photoreceptor unit' is used to indicate cognizance of the fact that lateral interaction effects may influence the response under appropriate conditions of stimulation. The principal objective of the investigation is to determine whether the outstanding features of the psychophysical data can be reproduced or approximated electrophysiologically.

AD-625 917 Fld. 6/16
CFSTI Prices: HC $3.00 MF $0.75
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
STUDIES ON BLOOD VISCOSITY AT LOW SHEAR RATES.
Annual rept. 1 Jan-31 Dec 65,
by Magnus I. Gregersen. 31 Dec 65, 76p. Contract DA-49-193-MD-2272

Unclassified report

Descriptors: (*Blood, Viscosity), Shear stresses, Torque, Hematocrit, Blood proteins, Fibrinogen, Erythrocytes, Albumins, Toxins + Antitoxins, Shock (Pathology), Liver, Blood vessels, Blood pressure, Blood volume, Blood plasma, Cardiovascular system, Autonomic nervous system, Spleen, Dogs

Blood viscosity was measured at low shear rates in a modified G.D.M. viscometer. At a shear rate of 0.01/sec, the time required to reach the maximum torque reading was dependent on hematocrit and plasma protein concentration. When hematocrit and other plasma proteins were held constant, the rise time was inversely related to the fibrino-

gen concentration. The shear-rate dependence of blood viscosity was attributed to two factors, namely the interactions between cells and plasma protein which predominated at low hematocrits and the direct cell-cell interactions which became more important at high hematocrits. The addition of albumin to cell suspensions caused a proportionate increase in viscosity at all shear rates, whereas the addition of fibrinogen raised the viscosity preferentially at low shear rates. Suspensions of hardened erythrocytes showed much higher viscosity than normal cell suspensions at the same concentration. Furthermore, filters with 5 micron pores allowed the passage of normal cells but not the hardened cells. The early hemodynamic changes in endotoxin shock in dogs consisted primarily of a marked constriction of small hepatic veins and venules, causing reductions of venous return, cardiac output and arterial pressure. The hepatic venoconstriction was not dependent on sympathetic activity. Following a partial recovery, the cardiac output and arterial pressure decreased again at 40 minutes postendotoxin. (Author)

AD-626 006 Fld. 6/16, 20/4
CFSTI Prices: HC $1.00 MF $0.50
AVCO EVERETT RESEARCH LAB EVERETT MASS
MOTIONS OF A LIQUID IN A PULSATING BULB WITH APPLICATION TO PROBLEMS OF BLOOD FLOW.
Research rept.,
by Robert T. Jones. Dec 65, 20p. Rept. no. rr-237
Contract Nonr-4881 (00)
Unclassified report

Descriptors: (*Blood circulation, Fluid flow), (*Liquids, Motion), Pulse systems, Containers, Heart, Simulation, Pressure, Cylindrical bodies, Contraction

Potential flows of the form phi = (ax sq. + by sq. + cz sq.) f (t) may be utilized to represent motions produced in pulsating bulbs. While the initial bulb shape may be arbitrary, sequential shapes are related by affine transformations. Two components appear in the distribution of pressure, one dependent on the instantaneous velocity and the other on the acceleration. Since he flows have stationary streamlines their inertial impedance is that of a simple mass, and is proportional to the first moment of the actual mass of fluid contained within the bulb. Examples treated are: (1) expanding and collapsing circular cylinders and (2) elliptical cylinders in which the periometer is held constant. The thickness of the pulsatile laminar boundary layer is found to be approximately one millimeter for conditions in the vicinity of the heart. Conditions for separation and turbulence probably differ from those in steady flow.

AD-626 012 Fld. 6/16, 5/10
ARMY MEDICAL RESEARCH LAB FORT KNOX KY EXPERIMENTAL PSYCHOLOGY DIV
STIMULUS CORRELATES OF WAVE ACTIVITY IN THE SUPERIOR-OLIVARY COMPLEX OF THE CAT.
by James C. Boudreau. 24 Aug 64, 14p. Rept. no. 634
Proj. DA-3A014501B74C Task 3A014501B74C01
Unclassified report

Availability: Published in Journal of Acoustical Society of America v37 n5 p779-85 May 1965. Copies to DDC users only.

Descriptors: (*Auditory perception, Electrophysiology), Nervous system, Physiology, Hearing, Adaptation (Physiology), Ear, Audiofrequency, Auditory nerve, Cats

Wave activity in response to tonal stimuli was recorded in the superior-olivary complex of anesthetized cats. A rapid and a slow phase of adaptation were observed. The intensity-amplitude curves were found to approximate power functions, with an average exponent of 0.34 for an 800-cps stimulus. The intensity-amplitude functions for stimuli between 200 and 2400 cps tended to form families of curves with maximum amplitudes between 500 and 1000 cps. Some factors inducing variability were discussed in detail. Comparison of superior-olive activity with eighth-nerve activity as described in published reports suggested that auditory information is transmitted through the cochlear nuclei to accessory nucleus in essentially an unmodified form. (Author)

AD-626 026 Fld. 6/16
STATE UNIV OF NEW YORK BROOKLYN DOWNSTATE MEDICAL CENTER
ADENINE-H3 UPTAKE IN NERVOUS TISSUE, INCLUDING REGENERATING NERVE CELLS, AS COMPARED WITH OTHER TISSUES IN EUTHYROID, HYPO AND HYPERTHYROID MALE RATS,
by H. Parkenberg, D. H. Ford, R. Rhines, and R. A. Israely. 19 Jan 65, 16p. Contract Nonr-4018 (01)Grant PHS-NB-4568-01
Unclassified report

Availability: Published in Acta Neurol. Scandinav. v41 p497-512 1965. Copies to DDC users only.

Descriptors: (*Adenine, Central nervous system), (*Thyroid gland, Diseases), Tissues (Biology), Nerve cells, Regeneration, Metabolism, Tritiated compounds, Radioactivity, Dosage, Autoradiography, Adenosine phosphates, Ribonucleic acids, Brain, Muscles, Erythrocytes

The amount of H3 present in parenchymatous and nervous tissue was determined over a period of 24 hours in euthyroid male rats after intravenous injection of adenine-H3. Different patterns of uptake were observed in four groups of tissue: (1) the red blood cells; (2) kidney, liver, thyroid and adrenal; (3) hypophysis and pineal; and (4) the nervous and muscle tissue. The uptake by red blood cells, which was far greater than that observed in any other tissue maintained through most of the experimental period at about 2.0 per cent of the injected dose/gram. During the first half hour, a maximal uptake of almost 5.0 per cent was noted. The second group of structures had uptakes of H3, which were from about 1/5 to 2/5 that seen in the red blood cells. All of these tissues showed an initial rapid uptake during the first hour, a slight decrease in activity levels during the second hour after which total H3 levels increased for the remaining period of investigation. The structures in group 3 (hypophysis and pineal) took up about 1/20 to 1/10 as much H3 as did the red blood cells and maintained relatively constant levels of radioactivity after the second hour.

AD-626 063 Fld. 6/16
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
A THIRD LOCUS OF DIGESTION,
by N. Zykov. Dec 65, 8p. Rept. no. FSTC-381-T65-574
TT 66-60182
Unclassified report

Trans. of Nauka i Zhizn (USSR) v32 n6 p26-8 1965.

Descriptors: (*Digestive system, Physiology), Gastrointestinal system, Food, Enzymes, Nutrition, Phagocytes, Cells (Biology), Intestines, Absorption (Biological), Hydrolysis, Electron microscopy, USSR

AD-626 117 Fld. 6/16, 5/10
SYRACUSE UNIV N Y LAB OF SENSORY COMMUNICATION
EFFECT OF CONTACTOR AREA ON THE VIBROTACTILE THRESHOLD,
by Ronald T. Verrillo. 9 Sep 63, 5p.
Unclassified report

Availability: Published in The Journal of the Acoustical Society of America v35 n12 p1962-6 Dec 1963. Copies to DDC users only.

Descriptors: (*Touch, Vibration), (*Thresholds (Physiology), Touch), Stimulation, Sensory mechanisms, Skin

Vibrotactile thresholds were determined as a function of frequency, contactor configuration, and contactor area. It was found that contactor area is a more important stimulus parameter than the gradient or curvature of displacement. The absolute threshold for vibration seems to be independent of frequency when very small contactors are used and independent of area at low frequencies. For higher values of these parameters, it strongly depends on both. It seems reasonable to conclude that responses to mechanical displacement of the skin are mediated by more than one receptor system, although direct evidence is still lacking. (Author)

AD-626 245 Fld. 6/16
CLEVITE CORP BEDFORD OHIO PIEZOELECTRIC DIV
DISTRIBUTION OF ELECTRICAL RESPONSES TO SOMATIC STIMULI IN THE DIENCEPHALON OF THE CAT, WITH SPECIAL REFERENCE TO THE HYPOTHALAMUS,
by P. Rudomin, A. Malliani, M. Borlone, and A. Zanchetti. 1964, 34p. Contract AF61 (052)-253 Proj. AF-9777 Task 977701
AFOSR 65-1790
Unclassified report

Availability: Published in Archives Italiennes de Biologie, v103 n1 p60-89 1965. Copies to DDC users only.

Descriptors: (*Brain, Electrophysiology), (*Electrophysiology, Brain), Thalamus, Stimulation, Cats, Italy

The basal diencephalon of intact immobilized cats under local anesthesia was systematically explored with stereotactically oriented electrodes, and the distribution of potentials evoked by single stimuli to somatic nerves was examined by alternatively employing a monopolar and bipolar leading arrangement. With the monopolar type of recording, almost the whole hypothalamus appeared responsive to somatic stimuli, and potentials picked up from adjacent structures were rather similar in shape, polarity and amplitude. Recordings with close coaxial bipolar electrodes gave a quite different, much more selective picture, some portions of the ventral diencephalon (lateral hypothalamus, subthalamus, etc.) being highly responsive to somatic stimuli, while other regions (preoptic and anterior hypothalamus, medial portions of the tuberal hypothalamus) did not show any consistent response. It is suggested that somatically evoked potentials in rostral parts of the hypothalamus, where responses are only detected monopolarly without evidence of local potential gradients in bipolar leads, are likely to represent activity originating at some distance and conveyed to the exploring electrode by electric spread. An alternative explanation is also discussed. (Author)

AD-626 259 Fld. 6/16
CLEVITE CORP BEDFORD OHIO PIEZOELECTRIC DIV
MICROELECTRODE RECORDING OF SLOW WAVE AND UNIT RESPONSES TO AFFERENT STIMULI IN THE HYPOTHALAMUS OF THE CAT,
by P. Rudomin, A. Malliani, and A. Zanchetti. 1965, 31p. Contract AF61 (052)-253 Proj. AF-9777 Task 977701
AFOSR 65-1789
Unclassified report

Availability: Published in Arch. Ital. Biol. v103 p90118 1965. Copies to DDC users only.

Descriptors: (*Electrophysiology, Thalamus); (*Thalamus, Electrophysiology), Brain, Stimulation, Cats, Italy

Recording with 1-5 micron tungsten microelectrodes from different portions of the diencephalon was performed with the aim of correlating unit and wave responses to afferent stimuli, in order to validate the local origin of sensory evoked potentials in these parts of the brain. In unanesthetized immobilized cats evoked responses to single radial stimuli, to clicks and to light flashes could be recorded in all diencephalic regions explored. Rather long latencies were observed for purely negative potentials in the anterior and preoptic hypothalamus, and in the midline and intralaminar thalamus, while shorter latencies, sometimes less than 10 msec, were found for a short positive deflection with which most of posterior and lateral hypothalamic responses were initiated. From the results obtained no conclusive evidence either pro or con the local origin of evoked waves in the anterior and preoptic hypothalamus could be obtained by microelectrode recordings, because of difficulties in isolating single unit discharges in these regions. (Author)

AD-626 366 Fld. 6/16
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
FACILITATION AND INHIBITION IN THE VISUAL SYSTEM AFTER PHOTIC STIMULATION,
by A. Cavaggioni, and M. H. Goldstein,Jr.. 1964, 25p. Contract DA-36-039-AMC-03200 Grant, NSF-G16526

Unclassified report

Availability: Published in Arch. ital. Biol., v103 p397-420 1965. Copies to DDC users only.

Descriptors: (*Vision, Electroencephalography), (*Cerebral cortex, Stimulation), Light, Optic nerve, Inhibition, Electrophysiology, Barbiturates, Anesthesia, Cats

A large enhancement of the characteristic waveform recorded from visual cortex in response to electric stimulation of the optic radiation is observed after photic stimulation. Only points 3, 4, and 5 of the shockevoked response are enhanced. These results are in agreement with those reported by Schoolman and Evarts (J. Neurophysical. 22:112-119, 1959). A similar enhancement is demonstrated after the termination of a prolonged photic stimulation. The enhancement is greatly reduced by deep barbiturate anesthetization. On presentation of the shock stimuli to the optic chiasm, an inhibitory effect is shown at the lateral geniculate body which is coincident with the facilitation of the cortex. The experiments indicate that it is not likely that the enhancement following transients in photic stimulation is mediated by reticular pathways. (Author)

AD-626 418 Fld. 6/16
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
SENSITIVITY OF THE SKIN TO CHANGES IN THE RATE OF INTERMITTENT MECHANICAL STIMULI,
by G. H. Mowbray, and J. W. Gebhard. 2 Jul 57, 22p. Rept. no. TG-282

Unclassified report

Descriptors: (*Skin, Sensitivity), Sensory perception, Touch, Eye, Ear, Visual perception, Auditory perception, Thresholds (Physiology), Nerve cells, Stimulation, Tables, Graphics

The procedure used on the skin of the fingertip was to measure difference-limens (DLs) for the rate of intermittent mechanical pulses at pulse repetition rates of 1 to 320 cps. The general method was the same as that used on the eye and the ear. In four experiments, three different kinds of electrically actuated mechanical stimulators were used: a modified loud speaker motor, a magnetic phonograph cutting head, and a miniature vibration generator.

AD-626 436 Fld. 6/16, 5/10
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SOME RELATIONSHIPS BETWEEN THE AVERAGE ENERGY OF THE QUANTA IN A VISUAL STIMULUS AND THE COLOR RESPONSE,
3230-1
TT 66-60261,

Unclassified report

Einige Zusammenhaenge zwischen der Mittleren Groesse der Quanten in Einem Lichtreiz und der Farbempfindung. Trans. of Vision Research (U. S.) v5 p361-77 1965.

Descriptors: (*Color vision, Stimulation), (*Photons, Color vision), (*Visual perception, Photons), Adaptation (Physiology), Quantum statistics, Retina, Absorption, Colors

It is shown that the ratio of the number of light quanta absorbed by the retina to the absorbed light energy is an important parameter in the elaboration of colour information by the visual sense. For this ratio, thus the number of quanta absorbed per unit of absorbed energy, the term 'specific quantum number' (SQN) is introduced. By measuring the SQN for various spectral regions it can be shown, on the basis of Grassmann's laws, that all light stimuli which occupy the same locus in colour space, independently of their colour composition (metamers), also have equal SQN's. The colour loci, for equal SQN in the colour triangle, lie along lines which coincide exactly with the tritanopic colour confusion lines. One component of the colour discriminating function of the visual sense derives from the ability to gauge differences in the specific quantum number. With the help of a simple model, the dependency of opponent-colour experience upon receptor excitation can be qualitatively described. (Author)

AD-625 675 See Fld. 6/5

AD-625 843 See Fld. 6/1

AD-625 869 See Fld. 6/4

AD-626 015 See Fld. 6/3

AD-626 308 See Fld. 6/15

AD-626 310 See Fld. 6/1

6/17. PROTECTIVE EQUIPMENT

AD-626 619 See Fld. 6/11

6/18. RADIOBIOLOGY

AD-625 714 Fld. 6/18, 20/8
CFSTI Prices: HC $1.00 MF $0.50
ARMED FORCES RADIOBIOLOGY RESEARCH INST BETHESDA MD
THE LOW-ENERGY COMPONENT OF THE TOTAL DOSE FOR DEEP GAMMA PENETRATIONS IN AIR AND WATER.
Technical note.,
by C. W. Garrett. Nov 65, 17p. Rept. no. AFRRI-TN-65-2

Unclassified report

Descriptors: (*Dfe rate, Gamma rays), (*Gamma rays, Penetration), Air, Water, Photons, Gamma-ray absorption coefficients, Monte Carlo method

A difference of a factor of two in the buildup factors for infinite water and infinite air at deep penetration distances (e.g., 10 mean free paths) for point isotropic cobalt-60 sources is noted. One possible cause for the discrepancy is the improper accounting of the dose delivered by low-energy photons (energies less than 100 keV) in the infinite air case, which was treated by a Monte Carlo analysis. The possible effects of this cause are presented, showing that lack of present knowledge of the differential number flux density for low-energy photons diffusing in low-Z materials leads to great uncertainty in the fraction of the total dose delivered by the low-energy component. Experimental data indicate that essentially all of the discrepancy between the water and air buildup factors could be attributed to a neglect of the low-energy dose. On the other hand, recent Monte Carlo calculation of the low-energy flux suggests that the cause for the discrepancy must be accounted for by other, at present undetermined, factors. (Author)

AD-625 779 Fld. 6/18
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EARLY DIAGNOSIS OF ACUTE RADIATION SICKNESS (SELECTED ARTICLES),
by S. N. Ledanova. 18 Oct 65, 245p. Rept. no. FTD-TT-65-589
TT 66-60131

Unclassified report

Unedited rough draft trans. of mono. K Voprosam Rannei Diagnostiki Ostroi Luchevoi Bolezni, Kiev, 1962 p1-4, 16-28, 62-94, 103-39, 147-68, 174-232.

Descriptors: (*Radiation sickness, Diagnosis), Blood proteins, Whole body irradiation, Nitrogen, Metabolism, Rats, Erythrocytes, Blood, Leukocytes, Glucose, Gastrointestinol system, Adjustment (Psychology), Adrenol glands, Proportional counters

AD-625 837 Fld. 6/18, 5/10
CFSTI Prices: HC $1.00 MF $0.50
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C
A COMPARISON BETWEEN THE EFFECTS OF EXPOSURE TO A MIXED FISSION SPECTRUM DELIVERED IN A SINGLE 'PULSE' AND X-RAYS DELIVERED AT A SLOWER RATE UPON THE CONDITIONED AVOIDANCE BEHAVIOR OF PRIMATES.
Technical rept.,
by Joseph C. Sharp, and Barbara K. Keller. Oct 65, 17p. Rept. no. TR-4

Unclassified report

Descriptors: (*Conditioned reflex, Radiation effects), (*Radiation effects, Dose rate), X rays, Fission products, Primates, Behavior, Pulse systems

AD-625 949 Fld. 6/18
CFSTI Prices: HC $1.00 MF $0.50
YOKOHAMA MUNICIPAL UNIV (JAPAN) FACULTY OF MEDICINE
THE EFFECT OF COBALT-60 GAMMA RADIATION ON THE CENTRAL NERVOUS SYSTEM.
Semi-annual rept. 4 Aug 64-3 Feb 65,
by Akira Tauya. 3 Feb 65, 10p. Contract DA-CRD-AG-S92-544-64-G24
ARDG (FE) J-223

Unclassified report

Descriptors: (*Central nervous system, Radiation effects), (*Radiation effects, Central nervous system), Brain, Gamma rays, X rays, Radiological dosage, Whole body irradiation, Pathology, Electroencephalography, Japan

Different sensitivity to the ionizing radiation on the various parts of the brain were studied, electroencephalographically. Between the frontal cortex and the hippocampus, different transition of the sleepy stage was demonstrated, suggesting dissociated response in these regions, by irradiation over 1000r. Subcortical structure is remained to be studied for future investigation. (Author)

AD-626 121 Fld. 6/18, 6/5, 6/3
ARMY TROPICAL RESEARCH MEDICAL LAB APO 851 NEW YORK
ACQUIRED RESISTANCE IN MICE AND RATS AFTER EXPOSURE TO GAMMA-IRRADIATED CERCARIAE,
by Duane G. Erickson, and William L. Caldwell. 1964, 9p.
Unclassified report

Availability: Published in American Journal of Tropical Medicine and Hygiene v14 n4 p566-73 1965. Copies to DDC users only.

Descriptors: (*Rodents, Schistosoma), (*Resistance (Biological), Rodents), (*Radiation effects, Resistance (Biological)), (*Schistosoma, Radiation effects), Immunity, Larvae, Eggs, Gamma rays

No effect on penetration or maturation was evident when Schistosoma mansoni cercariae were irradiated with 1000 r of gamma radiation from Co-60. Cercariae irradiated with 2500-3000 r developed into schistosomes in which egg production was greatly decreased as compared with normal worms. When irradiated with more than 4000 r, the worms did not survive 8 weeks in mice, but even irradiation with 10,000 r failed to affect cercarial penetration. Repeated exposures of mice to cercariae irradiated with 6000-8000 r produced greater resistance than did a single exposure to irradiated schistosomes. Resistance was manifest either as a reduction in the number of worms maturing from a subsequent exposure to nonirradiated cercariae or as prolonged survival after exposure to otherwise lethal numbers of nonirradiated cercariae, or both. Exposure of rats to irradiated cercariae enhanced their natural resistance as measured by reductions in worm burdens 4 and 9 weeks after exposure to a chellenging infection. Four exposures of 5000 irradiated cercariae each produced greater resistance than did three exposures to 1000 irradiated cercariae. Infections with irradiated schistosomes induced greater resistance in rats than did infections with nonirradiated worms. (Author)

AD-626 122 Fld. 6/18, 6/5, 6/3
ARMY TROPICAL RESEARCH MEDICAL LAB APO 851 NEW YORK
THE FATE OF GAMMA-IRRADIATED SCHISTOSOMA MANSONI CERCARIAE IN MICE,
by Duane G. Erickson. 1965, 6p.
Unclassified report

Availability: Published in American Journal of Tropical Medicine and Hygiene v14 n4 p574-8 1965. Copies to DDC users only.

Descriptors: (*Mice, Schistosoma), (*Schistosoma, Radiation effects), (*Radiation effects, Resistance (Biological)), (*Resistance (Biological), Mice), Immunity, Gamma rays, Larvae, Lungs, Liver, Penetration, Tolerances (Physiology), Tissues (Biology), Histological techniques

Schistosomes irradiated with 8000 r from Co-60 penetrated into mice and migrated to the lungs at about the same rate as normal ones, but in somewhat fewer numbers. The maximum number of irradiated schistosomes was recovered by perfusion at 14 days after penetration, but their numbers rapidly declined thereafter. The first histological evidence of the death of these worms was found in the liver at 22 days after exposure. Only a few of the irradiated schistosomes could be recovered from mice by perfusion after 35 and 42 days, and these worms were very stunted and appeared to be moribund. The site of death of worms irradiated with 8000 r was primarily in the liver, but some worms were unable to migrate from the lungs and succumbed there. Mice were able to tolerate infections with irradiated schistosomes, and their tissues were restored to an apparently normal condition within a few weeks after the worms had perished from the effects of radiation and the host response. (Author)

AD-626 291 Fld. 6/18
ARMY MEDICAL RESEARCH LAB FORT KNOX KY BIOPHYSICS DIV
GLUCOSE CONTROL OF AN X-RADIATION INDUCED DIFFERENCE IN CO2 PRODUCTION BY YEAST CELLS.
Reprint rept.,
by Edward Spoerl, and R. J. Doyle. 14 Jul 65, 11p. Proj. DA-3AO14501A71E Task 05 USAMRL 644
Unclassified report

Availability: Published in Life Sciences v4 p1843-8 1965. Copies to DDC users only.

Descriptors: (*Yeasts, Radiation effects), (*Carbon dioxide, Yeasts), (*Glucose, Metabolism), Cells (Biology), Metabolism, X-rays

Incubation in glucose differentially affected CO2 rate, output lag and the difference between irradiated and unirradiated cells. A key reaction, evidently accomplished in a short time, associated with retention or loss of cell material, apparently not an enzyme induction and not clearly related directly to the radiation affected site, seemingly acted to prevent a compartmentation. (Author)

AD-626 320 Fld. 6/18, 2/5, 6/8
CFSTI Prices: HC $2.00 MF $0.50
NEW YORK STATE VETERINARY COLL ITHACA DEPT OF PHYSICAL BIOLOGY
METABOLISM OF SELECTED RADIONUCLIDES FED IN VARIOUS PHYSICAL FORMS TO ANIMALS.
Final rept., 4 Jun 64-30 Jun 65,
by C. L. Comar, R. A. Wentworth, and F. W. Lengemann. 30 Jun 65, 41p. Contract OCD-PS-64-117 Task 3144B
Unclassified report

Descriptors: (*Radioactive isotopes, Metabolism), (*Milk, Radioactive isotopes), (*Cesium, Ingestion (Physiology)), (*Strontium, Ingestion (Physiology)), Bovines, Goats, Swine, Secretion, In vitro analysis, Radioactive fallout, Meat, Radiological contamination

Body retention and secretion into milk were determined for Sr (85) and Cs (134) from the following sources: simulants of local fallout, Sr (85) (NO3)2, Sr (85)Cl2, and Cs (134)Cl. Four cows, 15 goats and 16 hogs were used in these studies. The Whole-Body Counter was employed to measure retention in the goats and hogs. The biological availability of radiocesium and strontium was found to be dependent upon the solubility characteristics of the fallout simulant and appears to be predictable from in vitro tests under some conditions. Interspecies differences in biological availability were not large. (Author)

AD-626 384 Fld. 6/18
CFSTI Prices: HC $1.00 MF $0.50
ARMY MEDICAL RESEARCH UNIT EUROPE
IONIZING RADIATION INJURY, PREVENTION AND TREATMENT.
Annual progress rept.,
by William E. Rothe, Edward J. Huycke, James L. Butterfield, and Jon W. Blumenstock. Oct 65, 24p.
Unclassified report

Descriptors: (*Radiation injuries, Tissues (Biology)), Humans, Laboratory animals, Scintillation, Water supplies, Blood transfusions, Adenine, Preservation, Potassium, Radioprotective agents, Radiological contamination, Whole body irradiation, Excretion, Radioactive isotopes, Uranium, Thorium, Radioactive fallout, Thyroid gland, Iron, Absorption (Biological), Vitamin B complex, Strontium, Military personnel

The objectives of the research were: (1) To determine natural levels of Alpha emitting nuclides in the biosphere. Human ribs and teeth, animal tissues and water were examined by mixing prepared materials with activated zincsulfide for scintillation counting. (2) To test the effectiveness of adenine as a blood preservative under field conditions. Survival of Cr-51 tagged stored blood in auto-transfused human volunteers was determined. (3) To measure the results of airborne training as reflected in increased whole-body potassium by whole body counting. Two groups of airborne selectees were counted in the liquid-scintillator whole body counter before and after three weeks of intensive physical training. A significant increase in Lean Body Mass was seen in both groups. (4) Clinical use of the whole body counter as a diagnostic tool and as a method of determining effective retention of radiopharmaceuticals. (5) To monitor handlers of gamma emitting materials for internal contamination. Occupationally exposed subjects were examined by whole body counting. (6) To correlate the results of whole body counting and analyses of expired air and excreta in patients known to have significant body burdens from the Uranium and Thorium series of natural radioisotopes. (7) To determine current levels of Cesium-137 burdens in humans from world-wide radioactive fallout. (Author

6/19. STRESS PHYSIOLOGY

AD-625 862 Fld. 6/19
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
FACTORS CONTRIBUTING TO THE DELAY IN THE PERCEPTION OF THE OCULOGRAVIC ILLUSION,
by Brant Clark, and Ashton Graybiel. 13 Aug 65, 21p. Rept. no. NSAM-944
NAVMED MR005-13-6001-1-120
Unclassified report

Prepared in cooperation with National Aeronautics and Space Administration, Washington, D. C. NASA-Order-R-93.

Descriptors: (*Visual perception, Stress (Physiology)), (*Illusions, Space perception), (*Space perception, Stress (Physiology)), Moments, Stress (Psychology), Force (Mechanics), Gravity, Adaptation (Physiology), Rotation

Five normal and eight labyrinthine defective men were studied in a slow rotation room to observe the effects of factors which contribute to delay in change in perception of the horizontal following a change in direction of resultant force acting on a subject. Results showed very small effects of pre-exposure conditions prior to change in direction of resultant force. Delays in presentation of a luminous target following a change in resultant force and before settings to the visual horizontal occurred, however, produced major, systematic effects on the perception of the visual horizontal. Results are discussed in terms of the interaction of visual and gravitational cues in producing the lag effect. (Author)

AD-625 863 Fld. 6/19
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE DIAL TEST: A STANDARDIZED PROCEDURE FOR THE EXPERIMENTAL PRODUCTION OF CANAL SICKNESS SYMPTOMATOLOGY IN A ROTATING ENVIRONMENT,
by Robert S. Kennedy, and Ashton Graybiel. 10 Jun 65, 31p. Rept. no. NSAM-930
NAVMED MR005-13-6001-1-113
Unclassified report

Prepared in cooperation with National Aeronautics and Space Administration, Washington, D. C., NASA-Order-R-93.

Descriptors: (*Motion sickness, Simulation), Rotation, Stress (Physiology), Medical exam-

ination, Probability, Illusions, Aviation medicine, Performance tests, Equilibrium, Semicircular canals

Part 1 describes a developmental study to identify an optimum Dial Test procedure and the results of using the procedure on three groups with differing aviation experience. The problem was to determine that combination of rotational velocity of a slow rotation room, time between dial settings, and number of sequences to be performed which would yield the best measure of susceptibility to motion sickness. Parts 2 and 3 report the correlations between Dial Test scores and the Modified Romberg and the Coriolis illusion, and with scores from a Motion Sickness Questionnaire. Modified Romberg scores had a small but significant relationship with Dial Test scores for the 'incoming flight student' group, and this relationship was almost significant for the 'proficiency billet aviator' group. Coriolis illusion scores were not significantly related to Dial Test scores but were in the predicted direction. Statistically significant relationships were obtained between Dial Test score and scores from two keys to the Motion Sickness Questionnaire; these need cross-validation, however. (Author)

AD-626 442 Fld. 6/19, 22/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
BIOLOGICAL DATA ON THE NIKOLAYEV AND POPOVICH FLIGHTS,
by Sonya G. Machelson, B. Egorov, and N. Varvarov. 12 Sep 62, 2p. Rept. no. AID-62-137 TT 66-60241

Unclassified report

Review trans. of Izvestiya (USSR) 31 Aug p4 1962 and Sovetskii Patriot (USSR) 26 Aug p2-3 1962.

Descriptors: (*Space medicine, USSR), Astronauts, Electrophysiology, Central nervous system, Electroencephalography, Space flight, Space communication systems, Weightlessness, Performance (Human), Diet

AD-626 489 Fld. 6/19
CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE
THE INFLUENCE OF SIMULATED ALTITUDE (18,000 FEET) ON UROFLOWMETRY,
by A. T. K. Cockett, and E. Bors. 1964, 7p. Contract AF-AFOSR-61-81 Proj. AF-9777 Task 977701
AFOSR 65-1777

Unclassified report

Availability: Published in Urol Intern v18 357-61 1964. Copies to DDC users only.

Descriptors: (*Urine, Fluid flow), (*High altitude, Urinary system), Stress (Physiology), Flowmeters, Medical equipment

Simulated altitude to 18,000 feet (380 mm of Hg.) in a chamber does not decrease or affect voiding rates in male subjects. The possible reduction in urodynamics at altitudes above 12,000 feet may depend upon factors such as vibration, noise, and temperature rather than altitude per se. Future investigations evaluating voiding rates at zero gravity (weightlessness) must await more frequent and prolonged manned orbital flights. (Author)

AD-626 614 **See Fld. 5/10**

6/20. TOXICOLOGY

AD-626 496 Fld. 6/20
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES
ISOLATION AND CHARACTERIZATION OF SEA URCHIN TOXIN,
by Charles B. Alender, George A. Feigen, and Joseph T. Tomita. 16 May 65, 10p. Contract Nonr-225 (00) Grant ,PHS-HE-03693-07 Proj. NR-107-342

Unclassified report

Availability: Published in Toxicon v3 p9-17 1965. Copies to DDC users only.

Descriptors: (*Echinodermata, Toxins + antitoxins), (*Toxins + antitoxins, Echinodermata), Proteins, Chemical properties, pH, Solubility, Chemical precipitation, Toxicity, Separation

It is shown that the active principle of sea urchin toxin is a non-dialyzable, thermolabile protein. It is pHstable, almost completely soluble in distilled water, and can be precipitated at relatively high potency in the presence of 2/3 saturated ammonium sulfate in a yield amounting to 26 per cent of the dry weight of the starting material. The potency tends to decline slowly at -20C with a half-life of approximately 3 years. Absorption peaks at 278 millimicrons. and 323 millimicrons are reduced by maneuvers which remove inert materials. On the basis of an ultracentrifugal analysis, the most active fraction, which has approximately 60 per cent of the lethal toxicity of the parent material, appears to be a single molecular species having a sedimentation coefficient of 2.6 Svedberg units at 20C. (Author)

AD-626 037 **See Fld. 6/3**

7/1. CHEMICAL ENGINEERING

AD-626 149 Fld. 7/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
TOTAL NON-CONDENSABLES RELEASED FROM SEA WATER IN SIMULATED VC, 200 GPH VC, AND FLASH EVAPORATOR DISTILLATION PROCESSES.
Interim rept. Jun-Sep 64,
by Layne E. Fuller. Nov 65, 49p. Rept. no. TN-N-667
Proj. Y-F015-11-04-611

Unclassified report

Descriptors: (*Distillation, Sea water), Evaporators, Chemical analysis, Simulation, Vaporization, Hydrolysis, Carbonates, Bicarbonates, Hydroxides, Carbon dioxide, PH, Chlorides, Solids

A detailed study of the non-condensables released from sea water under simulated and actual distilling conditions was made to provide necessary data for development of efficient venting techniques. Experimental work on a simulated vapor compression unit constituted the major portion of the investigation. Material on 200 GPH VC and flash evaporation processes was added for comparison. The relation between the amount of non-condensables released and the residence time of the water in the evaporator is discussed. The correlation of carbonate ion hydrolysis, residence time, and carbon dioxide evolution is shown to be a function of the feed to blowdown flow ratio.

AD-626 628 Fld. 7/1, 13/8
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE LATERAL MIXING OF FLUIDISED SOLIDS THROUGH MESHED AND UNMESHED APERTURES.
Revised ed.,
by A. C. Lochiel, and J. P. Sutherland. 30 Apr 65, 14p. Rept. no. NRC-8657

Unclassified report

Revision of manuscript submitted 7 Sep 64.

Availability: Published in Chemical Engineering Science v20 p1041-53 1965. Copies to DDC users only.

Descriptors: (*Fluidized bed processes, Mixtures), Two-phase flow, Gases, Velocity, Particle size, Industrial equipment

Rates at which solids mix laterally through meshed and unmeshed openings in vertical partitions subdividing a fluidised bed are reported. The effects on mixing of the superficial gas velocity, particle size, and total and fractional free aperture areas are assessed, and bed expansion data reported. The flux rate of material through the apertures was found to be directly proportional to the difference between the superficial and the minimum fluidising velocities, and inversely proportional to a power function of the mean particle diameter. Reducing the free area available for passage of material across the bed decreased the circulation flux rate: increasing the total aperture area had the same effect. These influences on mixing are explained, and the mixing rates and bed expansion data correlated against relevant experimental variables. (Author)

AD-625 852 **See Fld. 18/9**

7/2. INORGANIC CHEMISTRY

AD-625 758 Fld. 7/2, 7/4, 20/2
CFSTI Prices: HC $3.00 MF $0.75
BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING
INVESTIGATION INTO TRANSITION METAL COMPOUNDS.
Final rept. 1 Nov 63-31 Oct 65,
by Aaron Wold. 31 Oct 65, 70p. Rept. no. AF-3837/1
Contract AF19 (628)-3837 Proj. AF-5261 Task 526101
AFCRL 65-791

Unclassified report

Descriptors: (*Transition elements, Sulfides), (*Chalcogens, Transition elements), (*Crystallography, Chromium compounds), (*Aluminum compounds, Crystal growth), Oxides, Vanadium, Single crystals, Synthesis (Chemistry), Electrical properties, Zinc compounds, Manganese compounds, Cobalt compounds, Iron compounds, Copper compounds, Nickel compounds, Complex compounds, Selenium compounds, Semiconductors, Resistance (Electrical), Crystal structure, Cadmium compounds

The topics included are: preparation and electrical properties of some thiospinels, structure and electrical properties of some monoclinic ternary sulfides, ternary chalcogenides of vanadium and chromium, crystallographic study of several chromium spinels, and vapor growth of aluminum oxide crystals.

AD-626 137 Fld. 7/2, 7/4
CFSTI Prices: HC $1.00 MF $0.50
KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
MECHANISM OF INORGANIC REACTIONS.
Final scientific rept.,
by Reynold T. Iwamoto. 15 Oct 65, 6p. Contract AF-AFOSR-220-63
AFOSR 65-1913

Unclassified report

Descriptors: (*Oxidation-reduction reactions, Electrochemistry), (*Inorganic compounds, Oxidationreduction reactions), Solvents, Ions, Hydrates, Solvates, Complex compounds

A summary is given of studies concerning the use of non-aqueous solvents and of electrodes, in place of either the oxidant or the reductant, to obtain information fundamental to a better understanding of the mechanism of inorganic oxidation-reduction reactions. A list of publications generated under the contract is included.

AD-626 184 Fld. 7/2, 7/4
CFSTI Prices: HC $2.00 MF $0.50
RIAS INC BALTIMORE MD
THEORETICAL AND QUANTUM CHEMISTRY OF N, O, F COMPOUNDS.
Quarterly technical rept. no. 7, 9 Oct 65-9 Jan 66, by Joyce J. Kaufman. 9 Jan 66, 26p. Contract DA-31-124-ARO-D-203 ,ARPA Order 542 Proj. ARO-D-5084-C

Unclassified report

See also AD-466 669.

Descriptors: (*Oxidizers, Chemical properties), (*Nitrogen compounds, Molecular orbitals), (*Oxygen compounds, Molecular orbitals), (*Fluorine compounds, Molecular orbitals), (*Molecular orbitals, Oxidizers), Chemical bonds, Theory, Quantum mechanics, Programming (Computers), Spectra (Infrared), Ionization potential, Absorption spectrum, Fluorination, Molecular energy levels

The objective of the research is to investigate the theoretical and quantum chemistry of energetic N, O, F compounds with the aim of providing understanding of the fundamental bonding and behavior of these species. The goal is to establish the validity of and the criteria for using various theoretical techniques for the prediction of pertinent properties of these compounds. A new molecular SCF program is being written to replace the POLYATOM program. The chain which evaluates all integrals arising from d orbitals was rewritten. Calculational results by a modified three-dimensional 'extended Huckel' LCAO-MO procedure show good agreement with the experimental behavior and properties of O and OF compounds. Bond energies, bond lengths, infrared frequencies, ionization potentials, absorption spectra and fluorinating power all correlate well with the calculational results for overlap populations and energy levels.

AD-626 211 Fld. 7/2, 7/4
CFSTI Prices: HC $1.00 MF $0.50
TRACOR INC AUSTIN TEX
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
Quarterly status rept. no. 11, 1 Jul-30 Sep 65, by Larry G. Spears. 5 Jan 66, 23p. Rept. no. TRACOR-66-104-U
Contract Nonr-4054 (00) ,ARPA Order-399 Proj. RR001-06-02

Unclassified report

See also AD-446 383.

Descriptors: (*Oxidizers, Synthesis (Chemistry)), (*Nitrogen compounds, Fluorides), (*Fluorides, Electrochemistry), Ammonium compounds, Electrolysis, Concentration (Chemistry), Electrodes, Voltage, Electrolytes, Hydrogen compounds, Fluoroamines, Fluorination, Nickel, Corrosion inhibition

The electrolysis of NH4F in anhydrous HF at various concentrations and anode potentials was studied. If water is present in the electrolyte, the proportion of N2F2 is decreased and OF2 and NF3 are increased. It is apparent that water has a large effect on the electrode reactions and thus cannot be used as a passivator to decrease attack of the anode during electrochemical fluorinations. Additional studies were made to determine the conditions required for passivation of electrodes in liquid HF electrolytes. (Author)

AD-626 522 Fld. 7/2
MELLON INST PITTSBURGH PA
SOME OCTAMETHYLOXAMIDINIUM SALTS OF METAL CARBONYL ANIONS.
by R. B. King. 14 May 65, 6p. Contract AF-AFOSR-580-64 Proj. AF-9710 Task 971002 AFOSR 65-2390

Unclassified report

Availability: Published in Inorganic Chemistry v4 n10 p1518-20 Oct 1965. Copies to DDC users only.

Descriptors: (*Metal carbonyls, Salts), (*Organic nitrogen compounds, Metal carbonyls), Cobalt compounds, Vanadium compounds, Molybdenum compounds, Tungsten compounds, Chemical properties, Spectra (Infrared)

It was found that tetrakis (dimethylamino) ethylene with certain Co, Mo, V, and W carbonyl derivatives to form octamethyl oxamidinium salts of the corresponding metal carbonyl anions. The infrared spectra of the salts were obtained and their chemical properties were investigated.

AD-626 547 Fld. 7/2, 11/6, 8/10
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
CHEMICAL EQUILIBRIUM OF FERRIC ION IN SODIUM CHLORIDE MEDIUM,
by Tsaihwa J. Chow. 4 Jan 66, 4p. Contract Nonr-2216 (23) Proj. NR-083-005

Unclassified report

Availability: Published in Comptes rendus du Congres International de la Corrosion Marine et des Salissures Imprimerie de Sceaux p53-5 1965. Copies to DDC users only.

Descriptors: (*Corrosion, Chemical equilibrium), (*Iron compounds, Chemical equilibrium), Sea water, Sodium compounds, Chlorides, Hydrolysis, Hydroxides

The chemical equilibrium of ferric ion in 500 mM NaCl medium has been studied at 25C by determining the /Fe (3+)/ and hydrogen ion concentrations. Emf measurements were made using a glass electrode, Fe (3+)-Fe (2+) and Ag-AgCl electrode half cells. The emf data indicated that the hydrolysis of ferric ion in NaCl medium was a slow process, and the steady state was attained after 45 days. The main hydrolysis product was a precipitate with the empirical formula of Fe (OH)2.7Cl0.3. The equilibrium constant of the reaction Fe (3+) + 2.7 H2O + 0.3 Cl (-) reversibly yields Fe (OH)2.7Cl0.3 (S) + 2.7 H+ was calculated as log K = -3.05 0.10, and log Ks = -34.0=0.2. (Author)

AD-626 558 Fld. 7/2, 8/10, 8/5
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
PURE ARAGONITE SYNTHESIS.
Revised ed.,
by Yasushi Kitano, Kilho Park, and Donald W. Hood. 14 Aug 62, 2p. Contract Nonr-1286 (02) Grant ,NSF-G-11591

Unclassified report

Revision of manuscript submitted 12 May 62.

Availability: Published in Journal of Geophysical Research v67 n12 p4873-4 Nov 1962. Copies to DDC users only.

Descriptors: (*Aragonte, Synthesis (Chemistry)), (*Calcium compounds, Carbonates), Crystals, Labelled substances, Sea water, Tracer studies

By slow removal of CO2 from Ca (HCO3)2 solution containing MgCl2 at room temperature, pure and homogeneous aragonite crystals were obtained. During the crystal syntheses, labeling with either or both C14 and Ca45 was feasible. (Author)

AD-625 723 See Fld. 21/9

AD-625 794 See Fld. 7/4

AD-625 988 See Fld. 7/4

AD-626 059 See Fld. 7/4

AD-626 171 See Fld. 21/9

AD-626 202 See Fld. 7/4

AD-626 229 See Fld. 10/3

AD-626 394 See Fld. 7/4

AD-626 556 See Fld. 7/4

AD-626 557 See Fld. 7/4

AD-626 596 See Fld. 6/11

7/3. ORGANIC CHEMISTRY

AD-625 703 Fld. 7/3
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF CHEMISTRY
THE REACTION OF ALKYL ARYL SULFIDES WITH ETHYL TRICHLOROACETATE AND SODIUM METHOXIDE,
by William E. Parham, and Siemen H. Groen. 12 Mar 65, 4p. Contract DA-31-124-ARO (D)-152

AROD 2819:8

Unclassified report

Availability: Published in Journal of Organic Chemistry v30 p3181-4 1965. Copies to DDC users only.

Descriptors: (*Organic sulfur compounds, Substitution reactions), (*Sulfides, Substitutions reactions), Halogenated hydrocarbons, Acetates, Sodium compounds, Aromatic compounds, Alkenes, Inhibition

A study of the higher boiling products formed by reactions of ethyl trichloroacetate and sodium methoxide (dichlorocarbene) with ethyl phenyl sulfide, phenyl n-propyl sulfide, and methyl phenyl sulfide has shown that trichloromethyl substituted sulfides, and/or products derived from them by loss of hydrogen chloride, are formed. The mechanism of inhibition of addition of dichlorocarbene to olefins by sulfides and the mechanism of insertion of dichlorocarbene and/or the trichloromethyl group into sulfides appear to be related by a process involving a phenylmercaptocarbonium ion intermediate. (Author)

AD-625 725 Fld. 7/3
CFSTI Prices: HC $1.00 MF $0.50
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
A NEW SERIES OF ORGANOBORANES. IX. THE PREPARATION AND SOME REACTIONS OF SULFURCARBORANE DERIVATIVES.
Technical rept.,
by H. D. Smith,Jr., C. O. Obenland, and S. Papetti. Jan 66, 11p. Rept. no. TR-28
Contract Nonr-3395 (00) Proj. NR-356-431

Unclassified report

See also AD-615 819.

Descriptors: (*Organoboranes, Organic sulfur compounds), Preparation, Chemical reactions, Nickel compounds, Lithium compounds, Complex compounds, Decaboranes, Bromine compounds

The first examples of sulfur derivatives of orthoand meta-carborane are reported and the preparative reactions have been extended to include various Bbromocarboranes. Some chemistry of these derivatives is described including the preparation of an inner complex with nickel. (Author)

AD-625 808 Fld. 7/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY MEDICAL BIOMECHANICAL RESEARCH LAB WALTER REED ARMY MEDICAL CENTER WASHINGTON D C
POLYMETHYL ALPHA CYANOACRYLATES: I. MOLECULAR WEIGHT DETERMINATION

BY LIGHT SCATTERING. II. EFFECT OF VARIOUS ANIONIC INITIATORS ON TERMINAL STRUCTURE.
Final rept.,
by Harold J. Porter, and R. K. Kulkarni. Aug 65, 16p. Rept. no. TR-6512
Proj. DA-3A-014501-B71P Task 3A-014501-B71P-06

Unclassified report

Descriptors: (*Acrylic resins, Polymers), Polymerization, Molecular weight, Spectra (Infrared), Molecular structure, Ions, Water, Methanols, Cyanides, Nitriles, Refractive index

The weight average molecular weight found for polymethyl alpha cyanoacrylate was 17,600. But the number average molecular weight for the same material was ca 2000 by vapor pressure measurements. Therefore, the Mw/Mn is 8.8, indicating a wide molecular weight distribution. The infrared spectra for the polymers of methyl alpha cyanoacrylate polymerized with different nucleophiles differ only in the following regions: (1) OH absorption at 3300/cm, (2) OCH3 absorption at 1100/cm. The absorption peak at 1100/cm occurs only in the case of the methanol initiated polymerization product, indicating that OCH3 anion is the main initiating species in this case. The (OH) absorption, large in the case of water, is relatively small in the case of the other anions. This indicates that pyridine, B-alanine, cysteine, and glycine initiated polymers had very few polymer chains with (OH) as a terminal group. Consequently the terminal group for each polymer was most likely the corresponding anion of the pyridine, B-alanine, cysteine, and glycine.

AD-625 809 Fld. 7/3, 11/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY MEDICAL BIOMECHANICAL RESEARCH LAB WALTER REED ARMY MEDICAL CENTER WASHINGTON D C
CYANOACRYLATE ADHESIVES - PART II. SYNTHESIS AND CHARACTERIZATION OF ALKYL ALPHA CYANOACRYLATES.
Final rept.,
by George Brandes, and Ramchandra K. Kulkarni. Sep 65, 18p. Rept. no. TR-6514
Proj. DA-3A014501B71P Task 3A014501B71P-06

Unclassified report

See also AD-429 540.

Descriptors: (*Acrylic resins, Adhesives), Polymers, Polymerization, Cyanides, Nitriles, Synthesis (Chemistry), Preparation, Gas chromatography, Formaldehyde, Molecular weight, Physical properties, Refraction, Aliphatic compounds, Refractive index

Details of the preparative method for alkyl cyanoacrylates are given. The physical properties of the homologous series, methyl to octyl cyanoacrylates are presented along with those for allyl cyanoacrylate. The derived properties namely, Molar Refraction and Parachor values, exhibit linear increase with increasing molecular weight. This indicates that the homologous series investigated consist of reasonably pure chemical compounds. (Author)

AD-625 935 Fld. 7/3, 11/10
CFSTI Prices: HC $2.00 MF $0.50
COLORADO UNIV BOULDER
RUBBER RESEARCH: THE SYNTHESIS OF SPECIAL FLUORINE-CONTAINING MONOMERS.
Semiannual progress rept. no. 3, 1 Apr-1 Oct 65,
by J. D. Park, and J. R. Lacher. 10 Oct 65, 42p.
Contract DA-19-129-QM-1926

Unclassified report

See also AD-290 344, AD-432 978.

Descriptors: (*Fluorine compounds, Cyclobutenes), (*Cyclobutenes, Synthesis (Chemistry)), (*Cyclopentenes, Synthesis (Chemistry), (*Elastomers, Preparation), Heterocyclic compounds, Polycyclic compounds, Complex compounds, Grignard reagents, Halocarbon plastics, Halogenated hydrocarbons, Iodine compounds, Organic nitrogen compounds

Fluorine-containing compounds are being studied in order to synthesize monomers from which to obtain elastomers that will be resistant to chemicals and gasoline. Part I on highly fluorinated cyclobutene series: New olefins and nonconjugated diolefins are being studied as possible candidates for polymer evaluation as well as intermediates for synthesis of other monomers containing a heteroatom or atoms. Intermediates have been prepared that are bicyclobutenyl derivatives. The reactions of diiodo butene are being studied. Part II on highly fluorinated cyclopentenes. The studies concern nucleophilic displacement reactions, Grignard reagents, and synthesis of vinyl heptacyclopentene systems.

AD-626 001 Fld. 7/3
CFSTI Prices: HC $1.00 MF $0.50
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
ORDER OF ELECTROPHILIC SUBSTITUTION IN 1, 2 DICARBACLOVODODECABORANE (12) AND NMR ASSIGNMENT.
Technical rept.,
by J. A. Potenza, W. N. Lipscomb, G. D. Vikers, and H. Schroeder. Jan 66, 11p. Rept. no. TR-30
Contract Nonr-3395 (00) Proj. NR-356-431

Unclassified report

Descriptors: (*Organoboranes, Substitution reactions), (*Substitution reactions, Organoboranes), (*Nuclear magnetic resonance, Organoboranes), Bromination, Friedel-Crafts Reactions, Molecular spectroscopy, Molecular orbitals, Molecular structure

Experimental evidence is presented that o-B10C2H12 brominates under Friedel-Crafts conditions first at positions 9 and 12, and then at 8 (10). Together with existing evidence that chlorination under photochemical-conditions substitutes last at B atoms 3 and 6, a unique assignment of the B11 nuclear magnetic resonance spectrum is now possible, and a comparison with the molecular orbital predictions is presented.

AD-626 009 Fld. 7/3
FRANK J SEILER RESEARCH LAB AIR FORCE ACADEMY COLO
C13 MAGNETIC RESONANCE STUDY OF THE PROTONATION OF ACETIC AND BENZOIC ACIDS AND THEIR ETHYL ESTERS IN CONCENTRATED SULFURIC ACID,
by Gary E. Maciel, and Daniel D. Traficante. 7 Nov 64, 8p. Rept. no. SRL-65-0006
Proj. OAR-7903 Task 790300

Unclassified report

Prepared in cooperation with California Univ., Davis.

Availability: Published in Journal of Physical Chemistry v69 p1030-3 1965. Copies to DDC users only.

Descriptors: (*Acetic acids, Hydrogenation), (*Benzoic acids, Hydrogenation), (*Esters, Hydrogenation), Magnetic resonance, Carbon, Sulfuric acid, Organic solvents, Phenols, Acetones, Acetophenones, Carboxylic acids, Ions

C13 magnetic resonance spectra were obtained for solutions of acetic and benzoic acids and their ethyl esters in 97% sulfuric acid and in fuming (101%) sulfuric acid before and after a 5-hr. heating period at 50C. Comparison of the shifts obtained for the carbonyl group in these solvents with those obtained when phenol, acetone, and acetophenone are dissolved in sulfuric acid leads to the conclusion that the R-COH (+)-OH ion is formed when the carboxylic acids are placed in 97% or fuming sulfuric acid or when their ethyl esters are heated in fuming sulfuric acid for 5 hr. at 50C, and that the R-COH (+)-OC2H5 species are formed when the esters are placed in 97% sulfuric acid at room temperature. (Author)

AD-626 052 Fld. 7/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
PRODUCTION OF AZIDES OF CARBOXYLIC ACIDS AND ACIDS OF PHOSPHORUS,
by M. I. Kabachnik, and V. A. Gilyarov. Dec 65, 5p. Rept. no. fstc-381-T65-627
TT 66-60181

Unclassified report

Trans. of Patent (USSR) 154 275.

Descriptors: (*Azides, Production), (*Organic phosphorus compounds, Production), Synthesis (Chemistry), Carboxylic acids, Chlorine compounds, Anhydrides, Ammonium compounds, Patents, USSR

The method of production of azides of carboxylic acids and acids of phosphorus from chloroanhydrides of appropriate acids differs in that, in order to simplify the method and increase the yield of the desired product acid, chloroanhydrides are reacted with a concentrated solution of triethylammonium salt of hydrazoic acid in chloroform. (Author)

AD-626 053 Fld. 7/3
CFSTI Prices: HC $1.00 MF $0.50
DUKE UNIV DURHAM N C
CONDENSATIONS AND OTHER REACTIONS
Final rept., 1 Jan 63-31 Dec 65,
by Charles R. Hauser. 31 Dec 65, 4p. Contract DA-ARO (D)-31-124-G409
AROD 3581:13

Unclassified report

Descriptors: (*Condensation reactions, Bibliographies), (*Bases (Chemistry), Chemical reactions), (*Acids, Chemical reactions)

The document is comprised of a list of the 19 papers resulting from work done under the contract, and a list of research personnel and degrees granted.

AD-626 429 Fld. 7/3
PURDUE UNIV LAFAYETTE IND DEPT OF CHEMISTRY
NOVEL SEVEN-RING AZA-SULTONES VIA THE REACTION OF SULPHENES WITH NITRONES,
by W. E. Truce, J. R. Norell, R. W. Campbell, D. G. Brady, and J. W. Fieldhouse. 1 Sep 65, 1p.
Contract DA-ARO (D)-31-124-G146
AROD 3047:11

Unclassified report

Availability: Published in Chemistry and Industry p1870-1 1965. Copies to DDC users only.

Descriptors: (*N-heterocyclic compounds, Synthesis (Chemistry)), (*S-heterocyclic compounds, Synthesis (Chemistry)), (*O-heterocyclic compounds, Synthesis (Chemistry)), Nuclear magnetic resonance, Chemical reactions

The reaction of C, N-diphenylnitrone with methane sulfonyl chloride and thiethyl amine in benzene resulted in a seven-membered-ring aza-sultone, the structure of which was studied by N.M.R. and chemical methods.

AD-626 511 Fld. 7/3
BAKER LAB OF CHEMISTRY CORNELL UNIV ITHACA N Y

THE MECHANISM OF A DIELS-ALDER REACTION. I. A RETRODIENE DECARBOXYLATION,
by M. J. Goldstein, and G. L. Thayer Jr.. 19 Sep 64, 11p. Contract AF-AFOSR-142-63
AFOSR 65-2196

Unclassified report

Availability: Published in Journal of American Chemical Society v87 p1925-33 1965. Copies to DDC users only.

Descriptors: (*Diene synthesis, Reaction kinetics), (*Anhydrides, Decomposition), O-heterocyclic compounds, Complex compounds, Stereochemistry, Dipole moments

The mechanistic problem of Diels-Alder addition is reconsidered and the advantages to be gained from heavy atom kinetic isotope effect studies are indicated. Decarboxylation of the maleic anhydride adduct of alphapyrone is then shown to satisfy applicable criteria for Diels-Alder retrogression: (a) production of cis-1, 2-dihydrophthalic anhydride as the kinetically controlled product, (b) adequately first-order kinetics with enthalpy = 33.2 kcal./mole and entropy = 2.69 e.u., and (c) identification of the lactonic function as the source of 99.3% of the carbon dioxide liberated. The accepted structures of both reactant and product are confirmed but not that of an isomer of the product, the purported 4,5-dihydrophthalic anhydride, here identified as 1,4-dihydrophthalic anhydride. The dipole moment of the reactant (1.34 D.) is consistent with expectation for the endo isomer. (Author)

AD-626 514 Fld. 7/3
BAKER LAB OF CHEMISTRY CORNELL UNIV ITHACA N Y
THE MECHANISM OF A DIELS-ALDER REACTION. II. THE STRUCTURE OF THE TRANSITION STATE,
by M. J. Goldstein, and G. L. Thayer Jr.. 19 Sep 64, 12p. Contract AF49-942 Grant ,AF-AFOSR-142-63
AFOSR 65-2195

Unclassified report

See also AD-626 511.

Availability: Published in Journal of the American Chemical Society v87 n9 p1933-41 1965. Copies to DDC users only.

Descriptors: (*Diene synthesis, Reaction kinetics), (*Anhydrides, Decomposition), O-heterocyclic compounds, Complex compounds, Carbon, Oxygen, Chemical bonds, Stable isotopes, Stereochemistry

Carbon and oxygen kinetic isotope effects were determined for decarboxylation of the maleic anhydride adduct of alpha-pyrone. Subjected to both approximate and exact theoretical analysis, they require a one-center transition state: the C-C bond connecting the labile lactone to the remainder of the molecule is effectively broken in the transition state whereas the C-O connecting bond remains virtually intact. Exact analysis provides a more quantitative description and relates structural to experimental uncertainties. The reliability of these conclusions is shown to depend critically on the use of heavy atom kinetic isotope effects measured at multiple, adjacent sites. Some more general aspects of the onecenter and two-stage descriptions of Diels-Alder addition are discussed. (Author)

AD-626 549 Fld. 7/3
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
THE EFFECTS OF STERIC COMPRESSION ON CHEMICAL SHIFTS IN HALF-CAGE AND RELATED MOLECULES,
by S. Winstein, Peter Carter, F. A. L. Anet, and A. J. R. Bourn. 2 Aug 65, 4p. Contract DA-ARO (D)-31-124-G642 ,NSF-G-7423
AROD 3580:20

Unclassified report

Availability: Published in The Journal of the American Chemical Society, v87 n22 p5247-8 20 Nov 1965. Copies to DDC users only.

Descriptors: (*Polycyclic compounds, Stereochemistry), (*Stereochemistry, Polycyclic compounds), (*Organic oxygen compounds, Stereochemistry), Protons, Molecular properties, Alcohols, Ethers

A new kind of steric compression effect is reported, viz., a shielding of one of the protons in a CH2 group when the other proton is strongly compressed by an oxygen function. Some unusually large deshielding effects (1-4 p.p.m.) are also reported.

AD-626 623 Fld. 7/3, 11/9
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
SOME ASPECTS OF STEREOSPECIFIC POLYMERIZATION,
by D. M. Wiles. 1965, 4p.
NRC 8735

Unclassified report

Availability: Published in Chemistry in Canada np Oct 1965. Copies to DDC users only.

Descriptors: (*Stereochemistry, Polymerization), (*Polymerization, Reviews), Molecular structure, Molecular properties, Chemical analysis, Spectroscopy, Free radicals, Canada

Topics include: nomenclature; polymer configurations and properties; methods of measuring stereoregularity; stereospecificity in addition polymerizations.

AD-626 640 Fld. 7/3, 11/12
PRAIRIE REGIONAL LAB SASKATOON (SASKATCHEWAN)
GUAIACYL GLYCEROL AND QUINOL IN THE HEARTWOOD OF PINUS RESINOSA AIT,
by E. von Rudloff. 29 Oct 64, 1p.
NRC 8311

Unclassified report

Availability: Published in Chemistry and Industry p180-1 1965. Copies to DDC users only.

Descriptors: (*Wood, Tissue extracts), (*Glycerols, Wood), (*Quinones, Wood), Trees, Chemical analysis, Canada

AD-625 680 See Fld. 11/9

AD-625 815 See Fld. 11/10

AD-625 934 See Fld. 7/5

AD-626 041 See Fld. 20/2

AD-626 059 See Fld. 7/4

AD-626 068 See Fld. 6/8

AD-626 083 See Fld. 20/2

AD-626 312 See Fld. 7/5

AD-626 351 See Fld. 7/5

AD-626 396 See Fld. 6/1

AD-626 420 See Fld. 10/2

AD-626 441 See Fld. 21/4

AD-626 470 See Fld. 6/1

AD-626 573 See Fld. 6/1

AD-626 597 See Fld. 20/2

AD-626 600 See Fld. 18/3

7/4. PHYSICAL CHEMISTRY

AD-625 667 Fld. 7/4
CFSTI Prices: HC $3.00 MF $0.75
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
CONDENSATION IN RAREFACTION WAVE.
Technical rept., suppl. no: 2,
by Welby G. Courtney. Dec 65, 62p. Rept. no. RMD-5515
Contract Nonr-4154 (00) Proj. NR-092-517

Unclassified report

See also AD-608 542.

Descriptors: (*Condensation, Shock waves), (*Water, Condensation), (*Alcohols, Condensation), (*Carbon tetrachloride, Condensation), Shock tubes, Experimental data, Nucleation, Vapors, Temperature, Phase studies, Reaction kinetics

The condensation of water, methul alcohol, and carbon tetrachloride was investigated in the rarefaction wave in a shock tube, where the rarefaction wave passes through and cools the wet gas in the highpressure side of the diaphragm and thereby induces condensation. Inert gas was Ar and N2. A slow type of condensation and also 'pseudo shock' condensation was observed. Interpretation of the results has proven more difficult than anticipated. This report presents the raw experimental data for the consideration of other workers. (Author)

AD-625 668 Fld. 7/4
CFSTI Prices: HC $3.00 MF $0.75
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
CONDENSATION OF WATER VAPOR IN A CLOUD CHAMBER.
Technical rept.,
by Welby G. Courtney. Nov 65, 68p. Rept. no. RMD-5515
Contract Nonr-4154 (00) Proj. NR-092-517

Unclassified report

Descriptors: (*Condensation, Water vapor), (*Water vapor, Condensation), (*Cloud chambers, Condensation), Nucleation, Phase studies, Reaction kinetics, Temperature

The condensation of water vapor was investigated in a cloud chamber by measuring pressure as a function of time. A dense mist reproducibly formed, suggesting homogeneous nucleation occurred in the present work. Nucleation at low temperature (approximately 230K) was significantly faster than the 0.4 particles/cc predicted by the classical theory of nucleation, and the classical theory therefore is suspect. The present results were compared to several models of condensation kinetics obtained by combining collisionfrequency growth kinetics with the recent 10 to the 20th power -revised nucleation theory amended for various types of monomer loss. Results faintly suggested that ultra-small water clusters are about 10 to the minus 3rd as stable as predicted by macroscopic cluster thermodynamics. Compression of the bulk gas due to heat conduction from the hot walls was appreciable, both during and after expansion. Previous work which appeared to support the classical nucleation theory probably is obscured by heat conduction during expansion. (Author)

AD-625 672 Fld. 7/4, 20/12
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
ON THE DETECTABILITY OF THE QUADRATIC NMR ELECTRIC-FIELD EFFECT IN LIQUIDS,
by J. M. Deutch, and J. S. Waugh. 7 Jun 65, 2p.
Contract DA-36-039-AMC-0322 (E)

Unclassified report

Availability: Published in The Journal of Chemical Physics, v43 n7 p2568-9 1 Oct 1965. Copies to DDC users only.

Descriptors: (*Nuclear magnetic resonance, Liquids), (*Electric fields, Liquids), Field theory, Dielectrics, Halogenated hydrocarbons, Organic nitrogen compounds

AD-625 695 Fld. 7/4
SHELL DEVELOPMENT CO EMERYVILLE CALIF
ON THE LONDON POTENTIAL BETWEEN PAIRS OF RARE-GAS ATOMS,
by J. Norton Wilson. 19 Apr 65, 2p. Contract DA-31-124-ARO (D)-54
AROD 4133:12

Unclassified report

Availability: Published in Journal of Chemical Physics v43 n7 p2564-5 1 Oct 1965. Copies to DDC users only.

Descriptors: (*Helium group gases, Polarization), (*Perturbation theory, Helium group gases), Electrostatics, Harmonic generators, Atomic orbitals, Molecular association

C6 (A, B) is taken as the coefficient of R to the -6 power in the conventional expansion of the London potential between two atoms of Species 'A' and 'B'. A simple method is described for obtaining accurate values of C6 (A,B) from C6 (A,A) and C6 (B,B). The method involves a minor modification of the Slater-Kirkwood equation.

AD-625 704 Fld. 7/4, 20/2
NATIONAL ELECTROTECHNICAL INST TURIN (ITALY)
FURTHER RESULTS ON CU REPRECIPITATION AND ELECTROLUMINESCENCE,
by G. Bonfiglioli, and A. Mojoni. 22 Feb 65, 2p. Contract AF-EOAR-87-63
AFOSR 65-1897

Unclassified report

See also AD-617 817.

Availability: Published in Physics Letters v15 n4 p300-301 Apr 15 1965. Copies to DDC users only.

Descriptors: (*Electroluminescence, Copper), (*Chemical precipitation, Copper), (*Single crystals, Electroluminescence), Annealing, Sulfides, Zinc compounds, Crystal lattice defects, Aging (Materials)

Previous work (AD-617 817) dealing with the connection of electroluminescence of Cu-doped ZnS single crystals to Cu reprecipitation and related thermal aging effects is extended and complemented.

AD-625 715 Fld. 7/4
CFSTI Prices: HC $4.00 MF $1.00
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
LIQUID-GAS INTERFACES STUDIED ON THE BASIS OF THE CLASSICAL SURFACE TENSION THEORY AND INTERMOLECULAR FORCE MODELS.
Technical rept.,
by Barry Flachsbart, and Max Anliker. Sep 65, 131p. Rept. no. sudaer-245 TR-15
Contract Nonr-225 (30) Grant ,NSF-GK-47 Proj. NR-064-425

Unclassified report

Descriptors: (*Surface tension, Fluids), (*Potential theory, Molecular structure), Liquids, Gases, Mathematical models, Chemical equilibrium

Liquid-gas interfaces are studied from two viewpoints. The first method uses the classical surface tension model of the interface. The differential equation defining the equilibrium shape of the interface relates the surface tension with the pressure difference across the interface. The boundary conditions for the equation assume that the contact angles (the angles the liquid forms with the container waalls) are constant and independent of the body forces. An iterative method for finding the equilibrium shape is developed, for the case of small body forces. The method is used in two cases and compared with results of other methods. The stability of the interface is investigated for a two-dimensional layer spread over a segment of a rigid cylinder with rigid radial walls. The eigenfunctions of the vibrations of layers of nonuniform depth are expanded in terms of the eigenfunctions for the layers of uniform depth. Approximations are made by truncating the series. The coefficients are obtained by minimizing the mean square error along the interface. The results are given in the form of a relationship between a dimensionless stability parameter and the angle between the radial walls for the case of limiting stability. A comparison of the approximate results with known solutions shows good agreement.

AD-625 749 Fld. 7/4
CFSTI Prices: HC $1.00 MF $0.50
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
ELUCIDATION OF 11BORON NUCLEAR MAGNETIC RESONANCE SPECTRA BY HETERONUCLEAR SPIN DECOUPLING.
Technical rept.,
by G. D. Vickers, H. Schroeder, H. Agahigian, and E. A. Pier. Jan 66, 11p. Rept. no. TR-29
Contract Nonr-3395 (00) Proj. NR-356-431

Unclassified report

Descriptors: (*Nuclear magnetic resonance, Boron), (*Organoboranes, Nuclear spectroscopy), Nuclear spins, Decaboranes, Magneto-optic effect

It is indicated that heteronuclear spin decoupling does aid the evaluation of 11boron spectra in that the information obtained is compatible with the information obtained from the 64.2 Mc/sec. spectra. It is noted that these spectral evaluations might suggest an unexpected consideration pertaining to spectral assignments. Both the ortho and meta isomers have one pair of equivalent boron nuclei more intimately neighbored to carbon than the four equivalent boron nuclei, and two pair of equivalent boron nuclei further removed from carbon than the four equivalent boron nuclei. This suggests that the spectra should have one doublet on one side of the resonance of the four equivalent boron nuclei and two doublets on the other side. In both cases, the doublet is at higher field than the resonance of the four equivalent boron nuclei, and the pair of doublets is at lower field. This seems to suggest that carbon could be imparting a diamagnetic shift to its neighboring boron nuclei. A paramagnetic shift would be expected if only relative electronegativities were considered.

AD-625 794 Fld. 7/4, 7/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EFFECT OF HEAT ON THE PH OF WATER AND DYE SOLUTIONS.
28 Sep 65, 5p. Rept. no. FTD-TT-65-355
TT 66-60141

Unclassified report

Edited trans. of Hua Hsueh T'ung Pao (Chinese People's Republic) n2 p65 1963.

Descriptors: (*Water, pH), (*Inorganic polymers, Oxyfluorides), Nitrides, Heat, Sulfur compounds, Complex compounds, Physical properties, Synthesis (Chemistry), USSR, Dyes, Solutions

The acidity of distilled water is usually attributed to dissolved carbon dioxide, and the carbon dioxide can be removed by boiling whereby the pH of the water returns to 7.0. Recently, the author has observed some interesting phenomena in experiments related to water and dye solutions (1). Freshly distilled water has a pH between 5.0 and 6.0, not 7.0 (2). When the temperature is raised from 20C to 100C, the pH will increase by 2.0 units, regardless of whether it is ordinary or specially distilled water. That is to say, if the pH of the water is 5.0 at 20C, it will be 7.0 at 100C and if it is 5.5 at 20C it becomes 7.5 at 100C.

AD-625 874 Fld. 7/4
CFSTI Prices: HC $2.00 MF $0.50
RIAS INC BALTIMORE MD
MOLECULAR VIBRATIONS BY A MATRIX FORCE METHOD.
Technical rept.,
by Stanley Kaufman, David B. Hall, and Joyce J. Kaufman. Sep 64, 26p. Rept. no. TR-64-16
Contract AF49 (638)-1220 Task 412
AFOSR 65-1803

Unclassified report

Descriptors: (*Polyatomic molecules, Vibration), (*Force (Mechanics), Matrix algebra), Molecular properties, Molecular structure, Valence, Alkenes, Polymers, Programming (Computers)

The utility was ascertained of an existing very large IBM 7094 digital program, based on a matrix force method, to the area of molecular vibrations. The derivation of the matrix force method is outlined and compared with the matrix displacement method. Some structural elements, useful in consideration of molecular vibrations, are illustrated. The frequencies and normal vibrational modes of the molecule ethylene were computed. The excellence of the agreement between the computed and observed frequencies and between the normal modes calculated by the program and by conventional techniques demonstrates the extreme versatility of the computer program. A valence force field approximation was used. The computer program is of such generality that virtually any force field approximation may be employed (including the widely used Urey-Bradley force field and modifications of it). The capability of the program to handle extremely large problems opens new vistas in the theoretical study of vibrations of conventional molecules and of such large and complex systems as molecular and ionic crystals, molecules of biological interest and polymers.

AD-625 878 Fld. 7/4
CFSTI Prices: HC $2.00 MF $0.50
ROCKETDYNE CANOGA PARK CALIF
CALCULATION OF VIBTATIONAL FORCE CONSTANTS.
Final rept. 1 Dec 61-31 Aug 65,
by E. C. Curtis. 31 Aug 65, 29p. Rept. no. R-6293
Contract AF49 (638)-1135 Proj. 9750 Task 975002 ,37501
AFOSR 65-1822

Unclassified report

Descriptors: (*Polyatomic molecules, Vibration), (*Force (Mechanics), Vibration), Chemical bonds, Valence, Molecular properties, Nitrogen compounds, Fluorides, Programming (Computers)

Better models are sought for the calculation of vibrational force constants of simple polyatomic molecules. An extensive system of computer programs were coded to aid in this work. Several models for force constants were examined and some new ones were developed. Force constants were calculated for several interesting molecules and in particular, molecules chosen to test the force constant models that were studied. (Author)

AD-625 895 Fld. 7/4, 6/4
CFSTI Prices: HC $1.00 MF $0.50
SPACE-GENERAL CORP EL MONTE CALIF ARTIFICIAL BIOSYSTEMS LAB
RESEARCH AND DEVELOPMENT PROGRAM ON AN ELECTROCHEMICAL ADAPTIVE SYSTEM FOR PATTERN RECOGNITION.

Quarterly progress rept. no. 2.
Nov 65, 18p. Rept. no. SGC-864
Contract NOw-65-0470-d

Unclassified report

Descriptors: (*Pattern recognition, Adaptive systems), (*Photochemistry, Pattern recognition), (*Electrochemistry, Adaptive systems), (*Adaptive systems, Pattern recognition), Iron, Nitric acid, Photoelectric effect, Optical scanning

The objective of this phase of investigation was the continued study of photostimulation of the passive surface of iron in nitric acid. Although stimulation by light of a single passive iron electrode has been achieved, investigation must proceed further before the longer-range goal is attained: a practical prototype of a radiant imaging input system for an adaptive electrochemical machine.

AD-625 923 Fld. 7/4, 20/5
CFSTI Prices: HC $1.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
OPTICAL SPECTRA OF RARE EARTHS. I. NEODYMIUM IN CALCIUM TUNGSTATE.
by Ruben T. Farrar. 22 Oct 64, 21p. Rept. no. TR-1309
Proj. HDL-36732 ,DA-1P01450A31C01

Unclassified report

Descriptors: (*Neodymium, Absorptum spectrum), Calcium compounds, Tungstates, Rare earth elements, Solids, Lasers

Crystal fields split the free ion spectra of rare earths when such ions are incorporated in crystalline solids. A scanning spectrometer was used to obtain the crystal absorption spectra of neodymium in calcium tungstate in the region 11,400 to 19,600/cm. From these spectra the energy levels are obtained and most of them are labeled with the irreducible representations of the SS4 point symmetry group of the crystal site that the neodymium ion occupies. (Author)

AD-625 931 Fld. 7/4, 20/8
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
CORRECTIONS TO THE INCOHERENT SCATTERING FACTORS FOR ELECTRONS AND X RAYS,
by R. A. Bonham. 30 Dec 64, 5p. Contract AF-AFOSR-602-64
AFOSR 65-2395

Unclassified report

Availability: Published in The Journal of Chemical Physics v43 n5 p1460-4 Sep 1 1965. Copies to DDC users only.

Descriptors: (*Incoherent scattering, Electrons), (*X rays, incoherent scattering), Atoms, Inelastic scattering, Corrections, Approximation (Mathematics), Neon, Germanium, Copper

The usual use of the closure relation in the derivation of the incoherent scattering factor for electrons and x rays involves approximations and introduces errors in the final result. Corrections through third order for these errors are given. The correction terms are found to be of a simple form and can be quite important not only in the limit of low energy for the incident electron or x-ray beam but also for atoms of large atomic number. The magnitudes of the corrections for Ne and Ge are given for 40-kV electrons. In the x-ray case corrections are given for Ge for Cu K-alpha x radiation. (Author)

AD-625 970 Fld. 7/4, 20/2
THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y
DIFFUSION VERSUS SURFACE LIMITATIONS IN VAPOR-SOLVENT GROWTH OF GERMANIUM,
by F. Jona. 5 Aug 64, 3p. Contract AF49 (638)-1201
AFOSR 65-2028

Unclassified report

Availability: Published in The Journal of Chemical Physics v42 n3 p1025-7 Feb 1 1965. Copies to DDC users only.

Descriptors: (*Germanium, Crystal growth), (*Crystal growth, Mass transfer), Iodine, Bromine, Vapors, Transport properties, Pressure, Diffusion, Surface properties, Chemical equalibrium, Nucleation, Crystal structure, Solvents

Measurements of transport rates as functions of pressure in the systems germanium-iodine and germanium-bromine were carried out. The results are discussed in terms of Lever's theory for diffusive transport. It is concluded that while e the germaniumiodine system is highly diffusion limited, the germaniumbromine system is noticeably surface controlled. (Author)

AD-625 982 Fld. 7/4
CALIFORNIA INST OF TECH PASADENA DIV OF CHEMISTRY AND CHEMICAL ENGINEERING
AN IMPROVED METHOD FOR THE DETERMINATION OF KINETIC PARAMETERS FROM POTENTIALSTEP MEASUREMENTS,
by Peter James Lingane, and Joseph H. Christie. 29 Mar 65, 12p. Contract DA-31-124-ARO (D)-102
AROD 3406:10

Unclassified report

Availability: Published in Journal of Electroanalytical Chemistry v10 p284-94 1965. Copies to DDC users only.

Descriptors: (*Reaction kinetics, Electrochemistry), (*Electrodes, Reaction kinetics), Voltage, Measurement, Electric currents, Least squares method, Sodium compounds, Perchlorates, Zinc

A method is described for the determination of kinetic parameters from simultaneous measurement of both I and Q following application of a potential step. It is shown that the technique is valid for all times and that the need for a shorttime or a longtime approximation is eliminated. Good kinetic parameters are obtained for the reduction of Zn (II) in NaClO4. It is suggested that the potential-step techniques need further investigation before they can be routinely applied to fast reactions. (Author)

AD-625 988 Fld. 7/4, 7/2
WARNER AND SWASEY CO FLUSHING N Y CONTROL INSTRUMENT DIV
MATRIX ELEMENTS FOR VIBRATION-ROTATION TRANSITIONS IN THE HBR OVERTONE AND HOT BANDS,
by Harold J. Babrov, Abraham L. Shabott, and B. SeshRao. 3 Feb 65, 11p. Contract AF49 (638)-1127 Proj. AF-9767
AFOSR 65-2262

Unclassified report

Availability: Published in The Journal of Chemical Physics v42 n12 p4124-31 Jun 15 1965. Copies to DDC users only.

Descriptors: (*Hydrogen compounds, Bromides), (*Bromides, Band spectrumm), (*Band spectrum, Bromides), (*Electron transitions, Bromides), Electric moments, Dipole moments, Wave functions, Chemical bonds, Rotation, Vibration, Line spectrum, Least squares method, Groups (Mathematics)

The strengths of the vibration-rotation lines of the first overtone, first hot band, and fundamental band of HBr were measured by a curve of growth method, applying a correction for two overlapping lines devised by Sakai. The squares of the electric-dipole matrix elements for the lines were calculated, and were fitted to a cubic and quadratic polynomial in m, using the method of least squares. The experimental results for all three bands are compared with the theory of Herman and Wallis. The squares of the matrix elements are used to calculate the dipole-moment coefficients for Morse and anharmonic oscillators.

AD-626 000 Fld. 7/4, 20/8
RUTGERS-THE STATE UNIV NEW BRUNSWICK NJ DEPT OF PHYSICS
SPIN-LATTICE RELAXATION IN CESIUM CHROME ALUM.
Final rept.,
by Robert David Turoff. 12 Jan 65, 5p. Contract Nonr-404 (08)

Unclassified report

See also AD-612 630.

Availability: Published in The Physical Review v138 n5A pA1524-A1527 31 May 65. Copies to DDC users only.

Descriptors: (*Relaxation time, Crystal lattices), (*Chromium, Ions), (*Paramagnetic resonance, Chromium), Nuclear spins, Cryogenics, X band, Cesium, Chromium compounds, Ammonium compounds, Sulfates

The spin-lattice relaxation times of three lines of the EPR spectrum at 9.6 kMc/sec of the Cr (3+) ion in cesium chrome alum have been measured as a function of temperature between 1.6 and 4.2K and dilution between 0 and 36 (ratio of nonmagnetic to magnetic ions) by the steadystate saturation method. The three lines were those at the lowest field, the second lowest field, and the highest field. The rates of relaxation increase with dilution for the low-field lines, and decrease with dilution for the high-field line. The dilution dependence for the high-field line can be qualitatively explained by cross relaxation, but the dilution dependences for the low-field lines elude explanation. The relaxation rate of each resonance line shows at least two temperature dependences at each dilution. They are interpreted as arising from a combination of cross relaxation and direct processes between 1.6 and 3.0K, and indirect processes between 3.0 and 4.2K. (Author)

AD-626 014 Fld. 7/4, 20/3
TEXAS UNIV AUSTIN DEPT OF PHYSICS
CONDUCTION PROCESSES IN CONCENTRATED METALAMMONIA SOLUTIONS,
by J. C. Thompson. 3 May 65, 16p. Contract Nonr-3734 (00) Proj. NR-017-457

Unclassified report

Availability: Published in Advances in Chemistry Series n50 p96-110 1965. Copies to DDC users only.

Descriptors: (*Solutions, Electrical conductance), (*Metals, Solutions), (*Ammonia, Solutions), Electrical properties, Alkali metals, Reflection, Hall effect, Theremoelectricity, Thermal conductivity, Magnetic properties, Electrons, Liquid metals, Models (Simulations)

The metallic nature of concentrated metal-ammonia solutions is usually called 'well known.' However, few detailed studies of this system have been aimed at correlating the properties of the solution with theories of the liquid metallic state. The role of the solvated electron in the metallic conduction processes is not yet established. Recent measurements of optical reflectivity and Hall coefficient provide direct determinations of electron density and mobility. Electronic properties of the solution, including electrical and thermal conductivities, Hall effect, thermoelectric power, and magnetic susceptibility, can be compared with recent models of the metallic state. (Author)

AD-626 038 Fld. 7/4
MARYLAND UNIV COLLEGE PARK
THEORY OF RESONANCE BROADENING OF SPECTRAL LINES BY ATOM-ATOM IMPACTS,
by A. W. Ali, and H. R. Griem. 18 Jun 65, 6p.

Unclassified report

Supported by NSF, ONR, and AFOAR.

Availability: Published in The Physical Review, v140 n4A pA1044-9 15 Nov 65. Copies to DDC users only.

Descriptors: (*Line spectrum, Perturbation theory), (*Resonance, Atomic energy levels), Atomic spectroscopy, Electron transitions, Excitation, Ground state, Atomic properties

The broadening of spectral lines due to dipole-dipole interactions with ground-state atoms of the same element is calculated with the impact and classical path approximations. Summation over all contributing intermediate states accounts for the multiplicity of the levels involved and results in a width proportional to the geometrical mean of absorption and emission oscillator strengths. Higher multipole interactions are shown to be almost negligible, and for Lyman-alpha- the iterated solution of the time-dependent Schrodinger equation describing the collisions is extended to fourth order. Estimated errors of its calculated width and of the widths of other lines are about 5% in the validity regime of the impact approximation, apart from any uncertainties in oscillator strengths and statistical weight factors. (Author)

AD-626 059 Fld. 7/4, 7/2, 7/3
CFSTI Prices: HC $1.00 MF $0.50
HULL UNIV (ENGLAND) DEPT OF CHEMISTRY
KINETICS OF HYDROGEN-OXYGEN AND HYDROCARBON-OXYGEN REACTIONS.
Final rept. Oct 62-Jun 65,
by R. R. Baldwin, and R. W. Walker. Jun 65, 15p. Contract AF-EOAR-31-63 Proj. AF-9751 Task 975101
AFOSR 65-1909

Unclassified report

Descriptors: (*Hydrogen, Reaction kinetics), (*Oxygen, Reaction kinetics), (*Hydrocarbons, Reaction kinetics), Programming (Computers), Carbon monoxide, Methane, Oxidation, Silanes, Hydrogen peroxide, Decomposition, Great Britain

Research in the following is summarized: The development of computer programs to interpret the various aspects of the H2-O2 reaction; The effect of CO on the H2-O2 reaction; the oxidation of CH4 when small amounts are added to slowly reacting H2-O2 mixtures; the effect of tetramethyl and tetraethyl silane on the second limit of the H2-O2 reaction; the decomposition of H2-O2 in the presence of H2 and CO.

AD-626 061 Fld. 7/4, 20/13
CFSTI Prices: HC $2.00 MF $0.50
VIRGINIA UNIV CHARLOTTESVILLE DEPT OF AEROSPACE ENGINEERING
DIFFUSION A AND HETEROGENEOUS REACTION. VIII. HEAT TRANSFER IN REACTING GASES.
Technical rept.,
by Henry Wise, Bernard J. Wood, and Yapa Rajapakse. Nov 65, 27p. Rept. no. TR-SRI-22-P
Contract Nonr-3623 (00) Proj. SQUID ,NR-098-038

Unclassified report

Subcontracted to Stanford Research Inst., Menlo Park, Calif. See also AD-604 108.

Descriptors: (*Gases, Heat transfer), (*Heat transfer, Gases), (*Oxygen, Heat transfer), Catalysts, Thermal conductivity, Chemical reactions, Atoms, Molecules, Concentration (Chemistry)

Measurements were made of heat transfer through gas mixtures containing atomic and molecular oxygen. In the presence of catalytic surfaces the collisional energy transfer is augmented by chemical enthalpy transport. The magnitude of the increase in heat flux is a function of atom density, total gas pressure, and catalytic surface activity. The relative values of the thermal accommodation coefficient of atomic and molecular oxygen are deduced from the changes in temperature jump distances. Also, a theoretical analysis is presented of heat conduction through a gas located between coaxial cylinders of different length. (Author)

AD-626 110 Fld. 7/4, 11/9
NATIONAL BUREAU OF STANDARDS WASHINGTON D C
CONFORMATION OF POLYSTYRENE ADSORBED AT THE THETA-TEMPERATURE,
by Robert R. Stromberg, Daniel J. Tutas, and Elio Passaglia. 10 Jun 65, 10p.
AROD 4252:4

Unclassified report

Availability: Published in The Journal of Physical Chemistry, v69 n11 p3955-63 Nov 1965. Copies to DDC users only.

Descriptors: (*Styrene plastics, Stereochemistry), (*Polymers, Adsorption), Films, Polarization, Molecular properties, Concentration (Chemistry)

The conformation of polystyrene molecules adsorbed on metallic surfaces at the theta-temperature was investigated by measurements of the extension of the adsorbed molecule normal to the surface. This extension was studied in situ by means of ellipsometry. The study was carried out on a series of samples with molecular weights ranging from 76,000 to 3,300,000. The extension of the adsorbed polymer molecule increases with adsorption time, indicating an initial flat conformation for the early arrivals that changes to a more extended form as additional molecules adsorb. The equilibrium extension increases with increasing solution concentration until a plateau is reached, again indicating a conformation dependence on the number of molecules competing for adsorption sites. The extension at these plateau regions is approximately proportional to the square root of the molecular weight, except for the highest molecular weight sample studied. This relationship is interpreted to indicate that the polymer is adsorbed under these conditions as a random coil. Comparisons are made between the measured extensions and end-to-end distances at reflecting and absorbing boundaries. Only small differences in extension were observed among a number of different metallic surfaces, indicating the nonspecific nature of polymer adsorption on such high energy surfaces. (Author)

AD-626 156 Fld. 7/4
CFSTI Prices: HC $1.00 MF $0.50
STATE UNIV OF NEW YORK BUFFALO DEPT OF CHEMISTRY
DIELECTRIC CONSTANT OF HYDROGEN-BONDED LIQUIDS.
Final scientific rept. 1 Feb 61-31 Aug 65,
by Walter Dannhauser. 1 Sep 65, 9p. Contract AF-AFOSR-271-63
AFOSR 65-1939

Unclassified report

Descriptors: (*Liquids, Dielectric properties), (*Dielectric properties, Liquids), (*Molecular association, Liquids), Molecular structure, Hydrogen, Chemical bonds, Entropy, Relaxation time, Alcohols, Amides, Nitriles

The principal goal of the project was to measure the dielectric constant of representative classes of hydrogenbonded liquids and to assess the influence of molecular structure (size and shape of the 'side chain' group) on intermolecular hydrogen-bond formation. Thirty-five compounds, representative of several classes of simple hydrogenbonded liquids, were investigated. Measurements quantitatively confirmed the intuitive conclusion that the extent of intermolecular, linear chain hydrogenbond formation is governed largely by an entropy effect, and that the size, and particularly the shape, of the molecule is the most important specific variable in the intermolecular association process. An added attraction of dielectric measurements is that they provide the possibility of obtaining information about the rate of dipolar reorientation from a study of dielectric relaxation.

AD-626 163 Fld. 7/4, 3/2
CFSTI Prices: HC $1.00 MF $0.50
HARVARD COLL OBSERVATORY CAMBRIDGE MASS
AUTOIONIZATION EFFECTS IN ULTRAVIOLET ABSORPTION SPECTRA OF HOT GASES,
by W. R. S. Garton. Nov 65, 25p. Rept. no. Scientific-6
Contract Nonr-1866 (48) ,NsG-438

Unclassified report

Descriptors: (*Gas ionization, Absorption spectrum), (*Atomic spectroscopy, Gas ionization), (*Ultraviolet spectroscopy, Gas ionization), Vapors, Heating, Shock tubes, Line spectrum, Electron transitions

Autoionization effects present in the ultraviolet absorption spectra of a number of atomic vapours (e.g. of the alkaline earths Ca-Ba, the Group III A elements Al-Tl and those of Group IV B, Si-Pb), are described, and some of the detail is interpreted qualitatively in the framework of the theory of lineshapes ('Beutler-Fano profiles'), recently put forward by Fano. (Author)

AD-626 164 Fld. 7/4, 3/2
CFSTI Prices: HC $2.00 MF $0.50
HARVARD COLL OBSERVATORY CAMBRIDGE MASS
THE ABSORPTION SPECTRUM OF CALCIUM VAPOR: 1660 - 2028 A,
by G. H. Newsom. Dec 65, 26p. Rept. no. Scientific-5
Contract Nonr-1866 (48) ,NsG-438

Unclassified report

Descriptors: (*Calcium, Absorption spectrum), (*Ultraviolet spectroscopy, Calcium), Vapors, Atomic energy levels, Line spectrum, Election transitions, Gas ionization, Probability, Shock tubes

The vacuum ultraviolet absorption spectrum of calcium vapor was observed in an attempt to discover transitions to new energy levels. Seven new levels were found between 51000 and 59000/cm, three of which are ascribed to the 3d5p, 3d6p, and 5s4p configurations, with the remaining four lines resulting from transitions to 3d4f and 3d5f configurations. The 3d5p 3P (1)o level reported by Ditchburn and Hudson at 52225/cm is now found at 51909/cm. A graph of relative cross-section for photoionization from the ground state of calcium is shown between 1660 A and the principal series limit. A shock tube was used to observe several transitions to autoionizing levels from excited states. (Author)

AD-626 188 Fld. 7/4, 11/9
CFSTI Prices: HC $5.00 MF $1.00
MELLON INST PITTSBURGH PA
POLYMER STRUCTURES AND PROPERTIES.
Final rept. 1 Jan-31 Dec 64,
by G. C. Berry, T. G. Fox, E. F. Casassa, T. A. Orofino, and J. W. Mickey,Jr.. Oct 65, 166p.
Contract AF33 (657)-10661 Proj. AF-7342 Task 734203
ML TDR-64-186-Pt-2

Unclassified report

Descriptors: (*Polymers, Molecular properties), (*Polymerization, Molecular properties), (*Styrene plastics, Solutions), (*Acrylic resins, Polymerization), Statistical analysis, Scattering, Thermodynamics, Solvents,

Viscosity, Thermal properties, Molecular structure, Toluenes, Polyester plastics, Osmotic pressure, Viscosimeters, Ions, Free radicals, Fatty acids, Anhydrides

Contents: Some statistical properties of flexible ring polymers, by E. F. Casassa; Thermodynamic interactions between geometrically dissimilar polymer chains, by E. F. Casassa; Note on the second virial coefficient for symmetrical comb molecules, by E. F. Casassa; Viscometric tests of excluded volume theories, by G. C. Berry and T. G. Fox; The intrinsic viscosity of linear polymers in interacting and in noninteracting media, by G. C. Berry; Intrinsic viscosity-temperature relationships at temperatures below the Flory point, by T. A. Orofino and J. W. Mickey, Jr; Temperature dependence of unperturbed polymer dimensions, by T. A. Orofino and J. W. Mickey, Jr. (in collaboration with A. Ciferri); Thermodynamic properties of polystyrene in toluene, by G. C. Berry; Dilute solution studies on branched polystyrenes, by G. C. Berry; Dilute solution studies on polycarbonates; A low shear rate viscometer for intrinsic viscosity-temperature studies, by G. C. Berry and G. L. Bender; Anionic polymerization of methyl methacrylate, by W. H. Janes; Synthesis and properties of atactic poly (methyl methacrylate), by S. -P. S. Yen, T. G. Fox, and G. C. Berry; Freeradical polymerization of methacrylic anhydride, by M. Reinmoller.

AD-626 202 Fld. 7/4, 7/2
CFSTI Prices: HC $1.00 MF $0.50
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
PRESSURE INDUCED SHIFTS OF HYDROGEN FLUORIDE LINES DUE TO NOBLE GASES.
Technical scientific note,
by J. H. Jaffe, A. Rosenberg, M. A. Hirshfeld, and N. M. Gailar. Jun 65, 22p. Rept. no. TSN-1
Contract AF61 (052)-838
AFCRL 65-782

Unclassified report

Prepared in cooperation with Tennessee Univ., Knoxville. Dept. of Physics and Astronomy.

Descriptors: (*Molecular spectroscopy, Fluorides), (*Fluorides, Band spectrum), (*Hydrogen compounds, Fluorides), (*Helium group gases, Molecular spectroscopy), Line spectrum, Pressure, Kinetic theory, Israel

The pressure induced shifts of hydrogen fluoride 1-0 and 2-0 band lines due to noble gases were measured. The shifts have the same general features as those observed with HC1, but they display certain peculiarities that were interpreted by using a phase-shift theory with a particular collision model. (Author)

AD-626 316 Fld. 7/4
CFSTI Prices: HC $2.00 MF $0.50
AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF
ABSORPTION BY C02 BETWEEN 8000 AND 10,000/CM (1-1.25 MICRON REGION).
Scientific rept.,
by Darrell E. Burch,'David A. Gryvnvnak, and Richard R.Patty. 6 Aug 65, 37p. Rept. no. U-3200
Contract Nonr-3560 (00) ,ARPA Order-273

Unclassified report

Descriptors: (*Carbon dioxide, Absorption spectrum), (*Infrared spectroscopy, Carbon dioxide), Absorption spectrum, Pressure, Band spectrum, Wave transmission, Planetary atmospheres

The absorption by CO2 in the 9300 to 9650/cm region and 8000 to 8325/cm region weeere studied. Spectra were obtained for four samples of CO2 in the 1.0 micrron region at a pressure of 2.5 atmospheres and path lengths up to 933 meters. Spectra were obtained for ten samples of CO2 in the 1.2 micron region at pressures as high as 15 atmospheres for path lengths up to 32.9 meters and pressures as high as 2.50 atmospheres for path lengths up to 933 meters. The strengths of the important bands and the half-widths of several lines have been measured. Tables of transmittance versus wavenumber are included for both regions as well as photographs of most of the spectra. Also presented are bables of the integrated absorptance versus wavelength for both regions. (Author)

AD-626 348 Fld. 7/4, 20/8
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
A METHOD OF CALCULATION OF INTEGRALS OF PRODUCTS OF RADIAL ATOMIC WAVE FUNCTIONS,
by Stephan Ormonde, and Jerald S. Dick. 30 Nov 64, 4p. Contract AF29 (601)-6171

Unclassified report

Availability: Published in Mathematics of Computation v19 n92 p647-50 Oct 1965. Copies to DDC users only.

Descriptors: (*Wave functions, Iterative methods), (*Atoms, Wave functions), (*Hydrogen, Atoms), Integrals, Programming (Computers), Atomic orbitals

A simple computational procedure for the calculation of certain useful integrals in atomic physics is described. The procedure has been compared with other techniques and was found to be superior. (Author)

AD-626 365 Fld. 7/4, 20/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
TEMPERATURE DEPENDENCE OF THE RAMAN SPECTRUM OF BATI03,
by C. H. Perry, and D. B. Hall. 19 Jul 65, 3p.
Contract DA-36-039-AMC-03200 (E),Grant GP-2111

Unclassified report

Availability: Published in Physical Review Letters v15 n17 p521-3 25 Oct 1965. Copies to DDC users only.

Descriptors: (*Barium compounds, Titanates), (*Titanates, Raman spectroscopy), Temperature, Single crystals, Phase studies, Ferroelectricity, Optical properties, Crystal structure

The Raman spectrum of single-crystal BaTiO3 has been observed in the Stokes region over the temperature range 4-475K and becomes more complex as the temperature is lowered from the paraelectric state to the ferroelectric state. A strongly temperature-dependent vibration (varying between 230/cm and 270/cm-1) has been observed and interpreted as the longitudinal mode associated with the low-frequency transverse ferroelectric 'soft' mode. This transverse mode could not be observed, and it was presumably hidden under the relatively broad Rayleigh line. The results imply that the model which attributes the ferroelectric transition to an instability against an optical vibration may still be applicable, except that the variation of dielectric constant with temperature is not just associated with the low-frequency transverse mode but with the temperature-dependent longitudinal mode.

AD-626 394 Fld. 7/4, 7/2
CHICAGO UNIV ILL DEPT OF CHEMISTRY
HIGH-TEMPERATURE CALORIMETRY IN LIQUID OXIDE SYSTEMS. II. THE ENTHALPIES OF SOLUTION OF OXIDES OF TYPE MO IN VANADIUM (V) OXIDE,
by T. Yokokawa, and O. J. Kleppa. 12 Jul 65, 3p.
Contract DA-ARO (D)-31-124-G616
AROD 5107:3

Unclassified report

Availability: Published in Inorganic Chemistry v4 n12 p1806-8 Dec 1965. Copies to DDC users only.

Descriptors: (*Calorimetry, Vanadium compounds), (*Vanadium compounds, Oxides), (*Enthalpy, Vanadium compounds), Liquids, High-temperature research, Solutions, Solutes, Beryllium compounds, Copper compounds, Magnesium compounds, Calcium compounds, Strontium compounds, Barium compounds

The enthalpies of solution of ten different solid oxides in liquid V2O5 at 685 = 5C were measured. All solutes studied except BeO and CuO showed negative enthalpies of solution, the magnitude increasing sharply in the sequence BeO < MgO<CaO <SrO<BaO. The results are discussed in terms of the acid-base character of the solution process. (Author)

AD-626 398 Fld. 7/4, 20/12
PITTSBURGH UNIV PA DEPT OF PHYSICS
HIGH RF FIELD EFFECTS IN NUCLEAR MAGNETIC RESONANCE,
by W. I. Goldburg. 1965, 11p. Contract DA-ARO (D)-31-124-G284
AROD 2636:5

Unclassified report

Availability: Published in Nuclear Magnetic Resonance and Relaxation in Solids Proceedings of the Colloque Ampere (13th) p52-60 University of Leuven Sep 1-5 1964. Copies to DDC users only.

Descriptors: (*Nuclear magnetic resonance, Radio fields), Radiofrequency, Solids, Relaxation time, Magnetic properties, Field theory, Perturbation theory, Nuclear spins

The review is mainly concerned with the effect of a large rf field on the steady-state nuclear magnetic resonance signals usually observed in solids. Special emphasis is placed on the relationship between the high field theory due to Redfield and the theory of Bloembergen, Purcell, and Pound. Both theories are compared with experiment and found to be very satisfactory in their respective domains of validity. (Author)

AD-626 428 Fld. 7/4
SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY
DISSOCIATIVE EQUILIBRIA IN THE SYSTEMS AROMATIC HYDROCARBON (-), NA (+) TO RADICAL ANION (-) + NA (+),
by R. V. Slates, and M. Szwarc. 9 Jun 65, 8p.
Contract DA-ARO (D)-31-124-G521
AROD 4617:2

Unclassified report

Availability: Published in Journal of Physical Chemistry v69 n12 p41 24-31 Dec 1965. Copies to DDC users only.

Descriptors: (*Aromatic compounds, Dissociation), (*Sodium compounds, Dissociation), (*Dissociation, Chemical equilibrium), Salts, Ions, Electrical conductance, Polycyclic compounds, Diffusion, Disproportionation, Naphthalenes, Anthracenes, Oxidationreduction reactions

The conductance of the sodium salts of aromatic radical ions was investigated in THF. The dissociation constants of the respective ion pairs were determined and found to increase with the size of the anion. The equivalent conductivity values were determined, and their significance is discussed. Knowledge of Kdiss permits the correction of the values of the electron affinities of aromatic hydrocarbons which were previously determined potentiometrically and spectrophotometrically. The relation between the equilibrium constants derived by these two methods is discussed in terms of the equilibria established between ion pairs and those involving free ions, viz., A (-) + B reversibly yields B (-) + A (Kpt) as compared with A (-),M (+) + B reversibly yields, M (+) + A (Ksp). The two constants are related, namely,

Ksp/Kpt = K diss, A (-),M (+)/K diss, B (-), M (+). A similar problem arises when one considers the disproportionations of radical anions into dianions since the following equilibria have to be considered: 2A (-) reversibly yields A + A (2-); A (-) + A (-),Na (+) reversibly yields A (2-), Na (+) + A; and 2A (-),Na (+) reversibly yields A (2-),2Na (+) + A.

AD-626 497 Fld. 7/4
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF MATERIALS SCIENCES LAB
AN EXPERIMENTAL STUDY OF THE OPERATION OF A POROUS OXYGEN CATHODE,
Revised ed.,
by T. Katan, S. Szpak, and E. A. Grens II. 6 Aug 65, 7p. Contract NOw-64-0597-f
Unclassified report

Revision of manuscript submitted 10 Jun 65. Prepared in cooperation with California Univ., Berkeley.

Availability: Published in Journal of the Electrochemical Society, v112 n12 p1165-71 Dec 1965. Copies to DDC users only.

Descriptors: (*Cathodes (Electrolytic cell), Oxygen), (*Oxygen, Cathodes (Electrolytic cell)), Electrodes, Films, Operation, Voltage

A special oxygen cathode was designed to investigate the film model for operation of porous gas electrodes. This electode consists of a bed of approx. 55 micron silver spheres behind a thin electroformed mesh facing. The thickness of the bed can be adjusted, and the structure permits holding the electrolyte meniscus out of the electrode body. Measurements in 6.9N KOH (23.5C) confirmed the operation of the film mechanism. The overpotential/current density behavior of the electrode was in agreement with film model analysis with a film thickness of 0.05 microns. (Author)

AD-626 501 Fld. 7/4, 12/1
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
MULTIPOLE POLARIZABILITIES AND SHIELDING FACTORS FROM HARTREE-FOCK WAVE FUNCTIONS.
Revised ed.,
by P. W. Langhoff, and R. P. Hurst. 19 Apr 65, 13p. Contract AF-AFOSR-191-63
AFOSR 65-1965
Unclassified report

Prepared in cooperation with State Univ. of New York, Buffalo. Dept. of Physics.

Availability: Published in The Physical Review v139 n5A pA1415-25 Aug 30 1965. Copies to DDC users only.

Descriptors: (*Atomic enegy levels, Wave functions), (*Atomic charge, Wave functions), (*Wave functions, Polarization), Electric moments, Atoms, Field theory, Dipole moments, Perturbation theory

Electric dipole, quadrupole, and octupole polarizabilities and shielding factors are calculated for a large number of two-to twenty-electron S-state atoms and ions. The calculations are carried out with the framework of an uncoupled Hartree-Fock approximation, subject to the proviso that the exchange part of the Fock potential be expressable as a multiplicative function. All zeroth-order functions used are of the analytical Hartree-Fock type. The resulting numerical values are found to be strongly sensitive to the quality of the Hartree-Fock function used in the calculation, in agreement with Sternheimer's previous conclusion. This point proves to be of special importance in the case of the negative ions. In addition, it is shown that the variational method pioneered by Das and Bersohn, if carried out under proper orthogonality conditions, is equivalent to the present uncoupled HartreeFock approximation. Finally, it is noted that the variational method used in this work is less accurate than the Sternheimer numerical method; however, use of the variational method allows some simplification in the computational procedure. (Author)

AD-626 504 Fld. 7/4
MICHIGAN STATE UNIV EAST LANSING
MAGNETIC TRANSITIONS IN NI((NH2) 2CS)6BR2,
by H. Forstat, N. D. Love, and J. McElearney. 16 Apr 65, 7p. Contract AF-AFOSR-430-63
Proj. AF-9763 Task 976303
AFOSR 65-1962
Unclassified report

Availability: Published in The Journal of Chemical Physics v43 n5 p1626-30 Sep 1 1965. Copies to DDC users only.

Descriptors: (*Magnetic properties, Complex compounds), (*Complex compounds, Magnetic properties), Cryogenics, Phase studies, Single crystals, Anomalies, Entropy, Field theory, Thiourea, Nickel compounds, Bromides, Nuclear magnetic resonance, Tables

Heat-capacity measurements were made on single crystals of Ni ((NH2)2CS)6Br2 in the temperature range 1.3 17.4K. Two lambda-type anomalies were observed at 1.96 and 2.25K and are associated with paramagneticantiferromagnetic transitions. The total entropy change associated with these transitions is 2.24 cal/mol deg and differs by approximately 2% from the expected value of R log (2S + 1), where S = 1 for the Ni (++) ion. Approximately 78% of this total entropy change occurs above 2.25K. A calculation based on the simple molecular field theory provided an estimate of the exchange integral as well as the temperature dependence of the sublattice magnetization. These are compared with the results from the magnetic susceptibility and nuclear magnetic resonance. (Author)

AD-626 519 Fld. 7/4
STERLING CHEMISTRY LAB YALE UNIV NEW HAVEN CONN
EFFECT OF PRESSURE ON CONDUCTANCE. I. TETRAISOAMYLAMMONIUM PICRATE IN DIETHYL ETHER AND IN BENZENE,
by James F. Skinner, and Raymond M. Fuoss. 1 Feb 65, 10p. Contract AF-AFOSR-244-63
AFOSR 65-2382
Unclassified report

Availability: Published in Journal of Physical Chemistry v69 n5 p1437-43 May 1965. Copies to DDC users only.

Descriptors: (*Ammonium picrate, Electrical conductance), (*Electrical conductance, Pressure), Solvents, Ethyl ethers, Benzene, Concentration (Chemistry), Viscosity, Electrolytes

The conductance of tetraisoamylammonium picrate (TIAPi) was measured in diethyl ether at five concentrations from 0.000003 to 0.0003 at 30C to 5000 kg/sq cm. and in benzene at four concentrations from 0.0003 to 0.003 M at 25C to 750 kg./sq. cm. The change in conductance with increasing pressure in both solvents was explained in terms of decreased ionic mobility owing to increased solvent viscosity and shifts in the ion pair and triple ion association equilibria as a result of increased dielectric constant of the solvent. In the highly compressible ether, at concentrations below the conductance minimum, the conductance increased by about one order of magnitude while in benzene, at concentrations above the minimum, a small decrease in conductance appeared as predicted. An equivalent conductance value of 190 for TIAPi in ether and values of the center-tocenter contact distances for ion pairs (4.9 A.) and triple ions (15 A.) were obtained from the data. The corresponding Walden product for TIAPi in diethyl ether is 0.39, in good agreement with values of 0.42 in water, 0.47 in nitrobenzene, and 0.43 in ethylene dichloride. (Author)

AD-626 520 Fld. 7/4
STERLING CHEMISTRY LAB YALE UNIV NEW HAVEN CONN
DIPOLE ASSOCIATION,
by Claude Treiner, James F. Skinner, and Raymond M.Fuoss. 2 Jul 64, 7p. Contract AF-AFOSR-244-63
AFOSR 65-2381
Unclassified report

Availability: Published in Journal of Physical Chemistry v68 n11 p3406-9 Nov 1964. Copies to DDC users only.

Descriptors: (*Dielectric properties, Organic compounds), (*Organic compounds, Dielectric properties), Dipole moments, Solutions, Data, Amines, Alcohols, Pyrodines, Organic nitrogen compounds

Dimerization of dipolar solutes in solvents of low dielectric constant is proposed, and a method of determining association constants (and dipole moments) from dielectric constants and densities is derived. In dioxane, p-nitroaniline, m-nitrophenol, and pyridinium dicyanomethylide were found to have association constants of 0.37, 0.8, and 3, respectively. The logarithms of these constants are linear in the square of the dipole moments (4.38, 6.91, and 9.2) as expected from theory. (Author)

AD-626 556 Fld. 7/4, 7/2
CALIFORNIA UNIV SANTA BARBARA
SPECTRA OF C3 IN SOLIDIFIED GASES AT 4K AND 20K,
by R. L. Barger, and H. P. Broida. 17 May 65, 7p. Rept. no. TR-14
Contract Nonr-4222 (01) ,ARPA Order-125
Unclassified report

Availability: Published in The Journal of Chemical Physics v43 n7 p2364-70 Oct 1 1965. Copies to DDC users only.

Descriptors: (*Spectra (Visible + ultraviolet), Carbon), (*Carbon, Line spectrum), (*Polyatomic molecules, Carbon), Molecular beams, Absorption spectrum, Intensity, Solidified gases, Molecular energy levels, Electron transitions, Frequency

Wavelength, linewidth, and intensity measurements have been made from 3000 to 4500 A of the spectra of triatomic carbon molecules trapped in solid matrices of Ar, Kr, Xe, O2, N2, CO2, and SF6 at 4 and 20K. The carbon source was a Knudsen cell, operated at temperatures up to 2900K, from which effused a molecular beam with known densities of C3. Measurements of absorption intensities give an oscillator strength, averaged for all matrices, equal to 0.06 for the C3 group. Littel or no matrix effect on the intensities is found. However, experimentally determined corrections to the intensities are necessary for effects caused by apparent diffusion of carbon in the matrices to form nonabsorbing carbon aggregates. C3 linewidths vary with matrix from 40 to 500/cm, and C3 line shifts vary from -410 to 1065/cm. All matrix shifts are to the red except in the case of the CO2 matrix. No definite effect of temperature on linewidths or shifts is found. (Author)

AD-626 557 Fld. 7/4, 7/2
CALIFORNIA UNIV SANTA BARBARA
SPECTRA OF C2 IN SOLIDIFIED GASES AT 4K AND 20K,
by R. L. Barger, and H. P. Broida. 17 May 65, 6p. Rept. no. TR-15
Contract Nonr-4222 (01) ,ARPA Order-125
Unclassified report

Availability: Published in The Journal of Chemical Physics v43 n7 p2371-6 Oct 1 1965. Copies to DDC users only.

Descriptors: (*Spectra (Visible + ultraviolet), Carbon), (*Diatomic molecules, Carbon), (*Carbon, Band spectrum), Absorption spectrum, Molecular energy levels, Emissivity, Solidified gases, Electron transitions

Absorption features attributed to C2 were observed for carbon in solid Ar, Kr, Xe, N2, CO2, and SF6 matrices at 4 and 20K. Swan system f-values for C2 in these matrices were measured and are in agreement with measured values for the gas phase. Measurements of C2 emission and absorption in a Xe matrix showed that the first vibrational level of the ground electronic state was populated in the matrix at 4K, and that the vibrational energy was not easily removed. Absorptions from excited vibrational levels of the ground state also were observed for other matrices. (Author)

AD-626 595 Fld. 7/4, 20/12
CFSTI Prices: HC $6.00 MF $1.25
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
OPTICAL VIBRATION SPECTRA OF SOLIDS.
Final rept. 14 Jan 63-13 May 65,
by Shashanka S. Mitra. 3 Aug 65, 232p. Rept. no. IITRI-A6019
Contract AF19 (628)-2418 Proj. AF-5621 Task 562105
AFCRL 65-828

Unclassified report

Descriptors: (*Infrared spectroscopy, Solids), (*Raman spectroscopy, Solids), (*Ultraviolet spectroscopy, Solids), (*Semiconductors, Phonons), Cadmium compounds, Zinc compounds, Boron compounds, Nickel compounds, Cobalt compounds, Manganese compounds, Aluminum compounds, Magnesium compounds, Copper compounds, Oxides, Sulfides, Nitrides, Hydroxides, Alkali metal compounds, Halides, Crystals, Crystal lattice defects, Absorption spectrum

The infrared reflection and/or transmission spectra of CdS, ZnS, ZnO, BN, NiO, CoO, and their mixed crystals, MnO, Al2O3, Mg (OH)2 and Cu2S are reported at one or more temperatures. The Raman spectrum of ZnO is also reported. The experimental investigations also included the study of crystal field spectra of Ni (2+), Co (2+) and Mn (2+) in their respective monoxides. The infrared and the ultraviolet absorption by U-centers in alkali halides was studied and interpreted in terms of localized virational modes of the impurity centers. Theoretical investigations include discussions on: (i) The trends in the characteristic phonon frequencies of the II-VI compounds, (ii) the assignment of the multiphonon infrared absorption in GaAs using the space group selection rules, (iii) the validity of the LyddaneSachs-Teller relationship at long wavelengths, (iv) the combination of the lattice modes with the internal modes in a crystal containing polyatomic groups, and (v) the Gruneisen parameter for long wavelength optical modes in ionic crystals. (Author)

AD-626 624 Fld. 7/4, 7/5, 20/12
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
ELECTRON RESONANCE SPECTRUM OF S2 (-) IN SULFUR-DOPED POTASSIUM BROMIDE,
by J. R. Morton. 21 May 65, 3p.
NRC 8695

Unclassified report

Availability: Published in The Journal of Chemical Physics v43 n9 p3418-9 1 Nov 1965. Copies to DDC users only.

Descriptors: (*Potassium compounds, Bromides), (*Sulfur, Electron spin resonance), (*Electron spin resonance, Sulfur), (*Luminescence, Sulfur), Crystal lattice defects, Magnetic fields, Doping

AD-626 639 Fld. 7/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE PVT PROPERTIES OF WATER. I. LIQUID WATER IN THE TEMPERATURE RANGE 0 TO 150 DEGREES CENTRIGRADE AND AT PRESSURES UP TO 1 KB.
Revised ed.,
by G. S. Kell, and E. Whalley. 9 Dec 64, 59p.
Rept. no. NRC-7607

Unclassified report

Revision of manuscript submitted 20 Apr. 64.

Availability: Published in Philosophical Transactions of the Royal Society of London v258 (Series A) n1094 p565-617 2 Dec 1965. Copies to DDC users only.

Descriptors: (*Water, Kinetic theory), (*Kinetic theory, Water), Liquids, High-pressure research, Instrumentation

An apparatus for measuring the PVT properties of water with high accuracy up to 1 kb over a wide temperature range is described. A 57 ft. mercury column has been built primarily to calibrate free-piston pressure balances used in this work. The compression of water relative to mercury has been measured at intervals of 10 degC from 0 to 150 C and at pressures from 5 to 1026 b, to a reproducibility of 4 to 7 p.p.m. of the volume, and a maximum uncertainty of about 40 p.p.m. at 1000 b. The specific volumes are given in tabular form, and in terms of interpolation equations. The isothermal compressibilities at atmospheric pressure have been obtained with a standard error of about 0.03 x 0.000001/b. The thermal expansion of water relative to mercury at 5.30 b has been measured in the range 80 to 150C with an error not more than 5 p.p.m. at 80C, 10p.p.m. at 100C, and 20 p.p.m. at 150C. The specific volumes, densities, and thermal expansivities have been adjusted to atmospheric pressure and to saturation pressure using the compressions reported here, and are tabulated. A kink reported by Antonoff and Conan in the density of water as a function of temperature near 50.5C has been looked for; the density is smooth to 1 p.p.m. over the range 47.5 to 52.0C, and the reported kink does not exist. (Author)

AD-626 642 Fld. 7/4, 20/12
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE OBSERVATION OF GAS ADSORPTION PHENOMENA BY REFLECTION HIGH-ENERGY ELECTRON DIFFRACTION,
by P. B. Sewell, and M. Cohen. 10 May 65, 4p.
NRC 8574

Unclassified report

Availability: Published in Applied Physics Letters v7 n2 p32-4 Jul 15 1965. Copies to DDC users only.

Descriptors: (*Gases, Adsorption), (*Nickel, Surface properties), (*Monomolecular films, Electron diffraction analysis), Single crystals, Oxygen, Reflection, Canada

The letter reports on observations of monolayer adsorption phenomena on a nickel single-crystal surface, by grazing incidence reflection high-energy electron diffraction (RHEED).

AD-626 644 Fld. 7/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE CHEMISTRY
MEDIUM EFFECTS IN NUCLEAR MAGNETIC RESONANCE. IV. A REFINED THEORY FOR NONPOLAR GASES,
by F. H. A. Rummens, and H. J. Bernstein. 19 May 65, 4p.
NRC 8686

Unclassified report

Availability: Published in Journal of Chemical Physics v43 n9 p2971-3 1 Nov 1965. Copies to DDC users only.

Descriptors: (*Gases, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Theory), Molecular association, Protons, Solvents, Canada

Following the general theory for medium NMR shifts in gases, two improvements are proposed. For the calculation of the van der Waals interaction a repulsive term was added to the customary attractive term. Wherever intermolecular distances are required, a properly averaged distance between the site of the measured proton in the solute molecule and the center of the solvent molecule is used rather than the distance between the centers of the molecules. The implications of these corrections for nonpolar molecules are discussed, and new values for the bond parameters B are proposed. (Author)

AD-626 647 Fld. 7/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE CHEMISTRY
EPR SPECTRA OF MULTIPLE-ION COMPLEXES OF AROMATIC ANIONS IN SOLUTION,
by A. H. Reddoch. 21 Jun 65, 2p.
NRG 8708

Unclassified report

Availability: Published by Journal of Chemical Physics v43 n9 p3411-2 Nov 1 1965. Copies to DDC users only.

Descriptors: (*Complex compounds, Paramagnetic resonance), (*Aromatic compounds, Paramagnetic resonance), Lithium compounds, Sodium compounds, Naphthalenes, Benzophenones, Ions, Hyperfine structure

EPR spectra are reported in which the unpaired electron of an aromatic anion is coupled to two equivalent metal cations. Spectra were also obtained for the same systems in which only one cation is coupled to the electron. These systems are benzophenone ketyl and lithium in dimethoxyethane and naphthalene and sodium in tetramethylethylenediamine.

AD-625 687 **See Fld. 20/12**

AD-625 735 **See Fld. 20/13**

AD-625 758 **See Fld. 7/2**

AD-625 839 **See Fld. 14/2**

AD-625 846 **See Fld. 20/6**

AD-625 887 **See Fld. 4/1**

AD-625 937 **See Fld. 20/8**

AD-625 952 **See Fld. 5/1**

AD-625 962 **See Fld. 20/10**

AD-625 963 **See Fld. 20/10**

AD-625 979 **See Fld. 20/13**

AD-625 981 **See Fld. 21/2**

AD-625 998 **See Fld. 14/2**

AD-626 005 **See Fld. 22/3**

AD-626 019 **See Fld. 20/12**

AD-626 043 **See Fld. 20/12**

AD-626 137 **See Fld. 7/2**

AD-626 154 **See Fld. 11/9**

AD-626 165 See Fld. 3/2

AD-626 184 See Fld. 7/2

AD-626 211 See Fld. 7/2

AD-626 229 See Fld. 10/3

AD-626 391 See Fld. 20/11

AD-626 397 See Fld. 20/6

AD-626 420 See Fld. 10/2

AD-626 464 See Fld. 21/2

AD-626 600 See Fld. 18/3

7/5. RADIO AND RADIATION CHEMISTRY

AD-625 934 Fld. 7/5, 6/15, 7/3
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH TRIANGLE INST DURHAM N C
PHOTOCHEMICAL N-DEALKYLATION REACTIONS OF ACTINOMYCIN ANALOGUES.
Final rept. 26 Dec 61-24 Sep 65.
24 Sep 65, 8p. Contract DA-31-124-ARO (D)-169 Grant,DA-ARO (D)-31-124-G250 Proj. PU-54 ,PU-151
AROD 3418:2
Unclassified report

See also AD-624 117.

Descriptors: (*Antibiotics, Photochemistry), (*Amines, Photochemistry), (*N-heterocyclic compounds, Photochemistry), (*Ketones, Photochemistry), Quinones, O-heterocyclic compounds, Azines

Conclusions: Irradiation of 2-monoalkylaminophenoxaz-3-ones leads to tetracyclic oxazolo or oxazolinophenoxazines depending on the constitution of the monoalkylamino substituent. The presence of a 2-dialkylamino substituent in the same substrate increases the photo-reactivity of these phenoxazones, probably due to increased steric interaction with the ortho substituents. In this series also the initial step of the photochemical reaction appears to be that of hydrogen abstraction from the dialkylamino group by the excited quinone carbonyl group. The subsequent course of the reaction depends upon the nature of the dialkylamino grooup. This work provides a synthesis of novel pentacyclic compounds not easily accessible by other methods. The results indicate that the overall course of the photochemical reaction is influenced by the nature of the ortho substituent. (Author)

AD-626 116 Fld. 7/5, 6/1
ROSWELL PARK MEMORIAL INST BUFFALO N Y BIOPHYSICS DEPT
ZERO-FIELD ELECTRON MAGNETIC RESONANCE OF IRRADIATED GLYCINE PEPTIDES,
by Richard S. Mangiaracina. 9 Apr 65, 10p. Contract Nonr-2975 (00) Proj. NR-304 457
Unclassified report

Availability: Published in Radiation Research, v26 n3 p343-52 Nov 1965. Copies to DDC users only.

Descriptors: (*Peptides, Radiation chemistry), (*Free radicals, Magnetic resonance), (*Electron spin resonance, Peptides), (*Radiation damage, Peptides), Magnetic resonance, Amino acids, X rays, Hyperfine structure, Absorption spectrum

The technique of zero-field magnetic resonance was employed to investigate the free radicals produced by X-irradiation of some glycine peptides. The broad absorption lines in the ESR spectra of glycylglycine and acetylglycine are most probably the result of the presence of more than one radical rather than the effect of unresolved hyperfine interaction. Furthermore, evidence was presented to show that in glycylglycine the damage is localized on the alpha-carbon at the acid end of the molecule. The principal values of the hyperfine interaction tensor for the main radical in glycylglycine hydrochloride were established with high accuracy. The great similarity in the spectra of glycylglycine hydrochloride and glycylglycylglycine implies that irradiation gives rise to very similar free radicals in these compounds. Hence, it appears that in glycylglycine, acetylglycine, glycylglycine hydrochloride, and glycylglycylglycine the unpaired electron is located on the alpha-carbon at the acid end of the molecule. The X-ray damage probably consists of the removal of one or the other of the nonequivalent methylene protons. The removal of one of these protons, however, is always favored. These results indicate a remarkable degree of specificity in the X-ray damage of these glycine peptides. (Author)

AD-626 295 Fld. 7/5, 11/7
CFSTI Prices: HC $3.00 MF $0.50
AMERICAN CYANAMID CO STAMFORD CONN CENTRAL RESEARCH DIV
CHEMILUMINESCENT MATERIALS.
Technical progress rept. no. 10, 1 Sep-30 Nov 65,
by M. M. Rauhut, L. J. Bollyky, D. R. Maulding, R. A. Clarke, and B. G. Roberts. 30 Nov 65, 52p. Rept. no. 06-1432-25-Q10
Contract Nonr-4200 (00) ,ARPA Order-299 Proj. NR-356-452
Unclassified report

See also AD-621 845.

Descriptors: (*Photochemistry, Chemiluminescence), (*Chemiluminescence, Materials), (*Oxalates, Chemiluminescence), Synthesis (Chemistry), Peroxides, Solubility, Additives, Nitrophenols, Oxidation, Amides

Progress toward the development of chemiluminescent systems is reported with particular reference to systems encompassing the peroxy-oxalate-fluorescent compound mechanism. In a series of nine new oxalate esters, seven provided at least medium chemiluminescent intensities in standard qualitative chemiluminescence tests. The active compounds were all electronegatively substituted aryl esters, thus confirming previous conclusions. Solubilities in several solvents were determined for the more promising compounds as a preliminary to quantitative examination. Bis (2, 4dinitrophenyl) oxalate was investigated quantitatively in terms of reactant concentration effects and in terms of the effects of accelerators and inhibitors. Triethylamine and 2,4-dinitrophenol strongly accelerate the reaction; 2,6-di-t-butyl- 4-methylphenol has little effect on the reaction rate but severely reduces quantum yields. Fluorescer stability was found to increase at low hydrogen peroxide concentrations. In a series of eight compounds related to oxamide, four were found to be chemiluminescent in qualitative testing. (Author)

AD-626 312 Fld. 7/5, 7/3, 18/2
PICATINNY ARSENAL DOVER N J
SELF-DECOMPOSITION OF CARBON-14-LABELED ORGANIC COMPOUNDS,
by Phillip Rochlin. 21 Apr 65, 12p. Rept. no. TR-3078-Rev
AD 413-093,N63 ,N63 20394
Unclassified report

Availability: Published in Chemical Reviews v65 n6 p685-96 Dec 1965. Copies to DDC users only.

Descriptors: (*Labeled substances, Decomposition), (*Organic compounds, Decomposition), (*Radiochemistry, Organic compounds), Radiation damage, Chemical analysis, Dosage, Energy, Inhibition, Radioactive isotopes, Carbon, Reviews

Criteria for changes induced by radiation and methods for the determination of radioactive decomposition products are reviewed. Methods are given for the calculation of adsorbed dose, per cent decomposition, and G (energy yield) values. Tables are included of calculational results for all compounds for which sufficient data are available in the literature, and notes about additional compounds are included in the text. Consideration is given to procedures which have been recommended for the reduction of the amount of self-decomposition.

AD-626 351 Fld. 7/5, 7/3
HUGHES RESEARCH LABS MALIBU CALIF
TRANSIENT PHOTODECARBOXYLATION INTERMEDIATES,
by J. David Margerum. 18 May 65, 5p. Contract AF49 (638)-1264 Proj. AF-9762 Task 976203
AFOSR 65-2371
Unclassified report

Availability: Published in Journal of the American Chemical Society v87 n16 p3772-3 Aug 1965. Copies to DDC users only.

Descriptors: (*Acid-base reactions, Photochemistry), (*Photolysis, Free radicals), (*Free radicals, Absorption spectrum), Organic nitrogen compounds, Acetates, Acetic acids, Ultraviolet radiation, Dissociation, Carbon dioxide, Ions, Stability

A new type of excited state acid-base reaction is described in which six different carboxylate ions in aqueous solutions are photolyzed with near ultraviolet light and dissociate efficiently into carbon dioxide and a carbanion. The starting compounds all had nitrophenylacetate structures. The transient intermediates were nitrophenylcarbanions, five of which were identified by their absorption spectra and rate of decay following flash photolysis. Acid-anion structures are believed to stabilize these reactive intermediates, which have typical lifetimes of between one and sixty seconds. Photolysis products were identified and corresponded either to the addition of a proton to the carbanion or to the formation of a bibenzyl type structure. 4,4'-Dinitrobibenzyl was formed in high yield from the photolysis of 4nitrophenylacetic acid in aqueous base. (Author)

AD-626 517 Fld. 7/5, 20/5
NEW MEXICO UNIV ALBUQUERQUE DEPT OF CHEMISTRY
LUMINESCENCE FROM TRANSITION-METAL COMPLEXES: TRIS (2,2'-BIPYRIDINE)- AND TRIS (1,10-PHENANTHROLINE) RUTHENIDUM (II),
by G. A. Crosby, W. G. Perkins, and D. M. Klassen. 3 May 65, 9p. Contract AF-AFOSR-269-63
AFOSR 65-2386
Unclassified report

Availability: Published in Journal of Chemical Physics v43 n5 p1498-1503 Sep 1 1965. Copies to DDC users only.

Descriptors: (*Luminescence, Complex compounds), (*Complex compounds, Luminescence), (*Ruthenium compounds, Luminescence), (*Lasers, Materials), Transition elements, Pyridines, Polycyclic compounds, Nmeterocyclic compounds, Absorption spectrum, Continuous spectra, Electron transitions, Relaxation time

Absorption and emission spectra and mean lifetimes of the luminescence of tris (2,2'-bipyridine)- and tris (1, 10-phenanthroline)ruthenium(II) are reported. For the 2,2'-bipyridine complex, two weak absorption bands occurring at 15,050 and 18,550/cm are assigned, respectively, to the 1A1 6 to 3T1 and 1A1 6 to 1T1 transitions of d-d type, and the intense luminescence with origin at 17,250/cm is assigned to 1T1 6 to 1A1 fluorescence. For the 1, 10-phenanthroline complex, no intra-d transitions were observed in absorption, but the bright luminescence with origin at 17,700/cm was assigned to 1T1 6 to 1A1 fluorescence in analogy with the first compound. The energy levels are analyzed on the basis of an octahedral

model, and empirical values for the Racah B and C parameters for Ru II and the crystal-field parameter are evaluated. Possible users of the compounds for laser applications are suggested. (Author)

AD-626 609 Fld. 7/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
CO60 GAMMA-RADIOLYSIS OF DEUTERIUM-OXYGEN MIXTURES,
by D. A. Kubose. 3 Nov 65, 21p. Rept. no. USNRDL-TR-931
Proj. SF-111-01-03 Task 11275
Unclassified report

Descriptors: (*Heavy water, Radiation chemistry), (*Radiation chemistry, Reaction kinetics), Cobalt, Gamma rays, Deuterium, Oxygen, Concentration (Chemistry), Tritium, Reactor hazards

The rates of formation of deuterium oxide in Co60 gammairradiated gaseous mixtures of deuterium and oxygen have been examined at initial deuterium concentrations, (D2)o, ranging from 0.00037 to 0.0037 mole/l. First- and zeroorder reaction rates with respect to deuterium were observed for the low and high (D2)o, respectively. The corresponding rate constants found were 0.0053/hr and 0.0000045 mole/l hr at a dose rate of 5.61 x 10 to the 16th power ev/cc hr. The initial G values for deuterium oxide formation, G (D2O), for the low and high (D2)o were 2.9 and 7.3, respectively. A search for reaction products other than deuterium oxide, using ferrous sulfate and titanium sulfate reagents, established that (a) no deutefium peroxide was formed as a stable reaction product and (b) a wallstabilized species, whose identity was not extablished, was observed; it oxidized the ferrous sulfate reagent but did not react with the titanium sulfate reagent. An 8-fold change in the surface-to-volume ratio of the irradiation vessel did not significantly affect the concentration of this species. (Author)

AD-626 314 **See Fld. 20/5**

AD-626 400 **See Fld. 20/2**

AD-626 608 **See Fld. 18/8**

AD-626 624 **See Fld. 7/4**

8/1. BIOLOGICAL OCEANOGRAPHY

AD-625 986 Fld. 8/1, 6/1
INSTITUTE OF MARINE RESOURCES UNIV OF CALIFORNIA LA JOLLA
FATTY ACIDS DERIVED FROM LIPIDS OF MARINE ORIGIN,
by P. M. Williams. 24 Feb 65, 16p. Contract AT (11-1)-34 Grant ,Nonr (G)-00056-62 Proj. AT-108
Unclassified report

Availability: Published in Journal Fisheries Research Board of Canada v22 n5 p1107-22 1965. Copies to DDC users only.

Descriptors: (*Sea water, Fatty acids), (*Fatty acids, Sea water), (*Plankton, Fatty acids), (*Fishes, Tissue extracts), Lipids, Aquatic animals, Algae, Concentration (Chemistry), Liver

Fatty Acids in sea water were found in concentrations of 1-9 micrograms/litre and 1-30 micrograms/litre for the dissolved and particulate fractions, respectively. Little variations were observed with depth or along a profile from coastal waters out into the open ocean. The total dissolved fatty acid concentrations were 10 to 100 times lower than had been previously reported. The fatty acid content of surface sediments varied from 13 to 67 micrograms/g dry weight of sediment. Six species of marine phytoplanktonic algae, two zooplankton samples, and liver extracts from hake and whiting were analyzed for their fatty acid content. The algae showed individual patterns in the spectrum of fatty acids present. The zooplankton samples were similar to the hake and whiting liver extracts with respect to the ratios of palmitic to palmitoleic and stearic to oleic acids. (Author)

AD-626 069 Fld. 8/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
ANIMALS OF THE LITTORAL ZONE,
by E. Ninburg. Dec 65, 9p. Rept. no. FSTC-381-T65-602
TT 66-60188
Unclassified report

Trans. of Nauka i Zhizn (USSR) v32 n8 p156-9 1965.

Descriptors: (*Aquatic animals, Seacoast), Marine biology, Tides, Algae, Sponges, Mollusca, Echinodermata, Barnacles, Worms, USSR

AD-626 101 Fld. 8/1, 6/3
BRITISH COLUMBIA RESEARCH COUNCIL VANCOUVER
MARINE BORER ALDEHYDE OXIDASE,
by P. M. Townsley, and R. A. Richy. 22 Jan 65, 9p. Contract NRC-CG-9
Unclassified report

Canaidian Journal of Zoology v43 p1011-9 1965.

Descriptors: (*Marine borers, Oxidoreductases), Enzymes, Inhibition, pH, Aldehydes, Enzyme inhibitors, Wood, Oxidation, Substrates, Pelecypoda, Canada

A very active and specific enzyme, aldehyde oxidase, has been demonstrated and partially purified from the digestive tract of the marine borer, Bankia setacea (Tryon). In the presence of the enzyme, the substrate vanillin was oxidized to vanillic acid with the simultaneous reduction of oxygen, cytochrome c, 2,6-dichlorophenolindophenol, or methylene blue. Marine borer aldehyde oxidase does not oxidize the heterocyclic substrates N1-methylnicotinamide or hypoxanthine of mammalian hepatic aldehyde oxidase or milk xanthine oxidase. In addition, the inhibitors of hepatic aldehyde oxidase, menadione and estradiol, do not inhibit marine borer aldehyde oxidase. On the other hand, both the above-mentioned oxidases are inhibited by the sulfhydryl inhibitors arsenite and p-hydroxymercurybenzoate, and by cyanide. Marine borer aldehyde oxidase has an optimum activity between pH 4.5 and 5.5 and little activity at pH 7.8, a pH activity range quite different from that of the mammalian aldehyde oxidases. Oysters were found to contain only slight vanillin oxidase activity at pH 4.3, suggesting that the marine borer aldehyde oxidase activity is unique to the ship worm and is used for the oxidation of aldehydes found in wood. (Author)

AD-626 281 Fld. 8/1
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
CONGRESS OF THE HYDROBIOLOGICAL SOCIETY.
30 Nov 65, 1p. Rept. no. ACSI-I-7406
TT 66-60229
Unclassified report

Sezd Gidrobiologicheskogo Obshchestva. Partial trans. of Priroda (USSR) v54 n4 1965.

Descriptors: (*Marine biology, Symposia), Fishes, Oceanology, USSR

The First Congress of the All Union Hydrobiological Society of the Academy of Science of the USSR was conducted at Moscow University from 1 to 6 January 1965. Considerable interest was generated by reports touching on the general problems of biology of the oceans. Ideas and materials on the problems of bioenergetics of the ocean were presented, as well as on the most general principles of the distribution and abundance of life in the hydrosphere in light of problems of biological productivity, beginning with the initial production to the end of its chain--fish.

AD-626 317 Fld. 8/1, 6/3
CFSTI Prices: HC $3.00 MF $0.75
JOINT PUBLICATIONS RESEARCH SERVICE WASHINGTON D C
TUNAS AND SPEARFISHES OF THE PACIFIC AND INDIAN OCEANS,
by V. G. Osipov, I. V. Kizevetter, and A. V. Zhuravlev. Nov 65, 75p.
TT 66-60214
Unclassified report

Trans. of mono. Tuntsy i Mecheobrazne Tikhogo i Indiiskogo Okeanov, Moscow, 74p 1964.

Descriptors: (*Pacific Ocean, Fishes), (*Indian Ocean, Fishes), (*Fishes, Marine biology), Oceanology, Ships (Nonmilitary), Distribution, Morphology (Biology), Maps, Oceanographic data, Far East

Contents: Biology of tunas and spearfishes; Tuna fishing; scouting; particular features and prospects of fishing; descriptions of foreign fishing vessels; fishing gear; fishing boat gear and equipment; techniques and organization of longlining; techniques for processing tuna and other fish in tuna fishing; tunas; spearfishes; amberfishes; barracudas; sarda and sawara (Bonitos); frigate mackerels; dolphins; sharks and skates; handling the catch on board the fishing boats; tuna canning.

AD-626 545 Fld. 8/1
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
CHLOROPHYLL IN ARCTIC SEA ICE,
by S. Appollonio. 1965, 7p. Contract Nonr-1138 (01) ,Nonr-3996 (01) Proj. NR-307-105
Unclassified report

Availability: Published in Arctic v18 n2 p118-22 Jun 1965. Copies to DDC users only.

Descriptors: (*Chlorophylls, Arctic regions), Sea water, Ice, Algae, Ecology

8/2. CARTOGRAPHY

AD-626 045 Fld. 8/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED PHYSICS
THE DETERMINATION OF TREE HEIGHTS FROM PARALLAX MEASUREMENTS,
by G. H. Schut, and M. C. van Wijk. 1965, 14p. NRC 8720
Unclassified report

Availability: Published in The Canadian Surveyor, v19 n5 p415-27 Dec 1965. Copies to DDC users only.

Descriptors: (*Trees, Photogrammetry), (*Photogrammetry, Trees), Photointerpretation, Errors, Aerial photographs, Canada

This paper discusses various formulas in use for the computation of tree heights from parallax measurements in aerial photographs. The errors in the computed tree heights, caused by the various error sources, are derived for three different cameras and four flying heights. The results of experiments are given and conclusions are drawn on the choice of formula and camera format and the accuracy that can be obtained in practice. (Author)

AD-626 079 Fld. 8/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
PROCEDURES IN TOPOGRAPHIC MAP REVISION,
by A. M. Abolyan, and Z. I. Tolmacheva. Dec 65, 7p. Rept. no. FSTC-381-T65-635
TT 66-60198
Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n7 p52-4 1964.

Descriptors: (*Mapping, Terrain), Photogrammetry, State-of-the-art reviews, USSR

AD-626 247 Fld. 8/2, 2/2
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
METHODS OF COMPILING WORLD AGRICULTURAL CHARTS (METODIKA SOSTAVLENIYA MIROVYKH KART ZEMLEDELIYA),
1964, 8p. Rept. no. ACSI-I-8462-C
TT 66-60204
Unclassified report

Trans. from Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya, n2 1964.

Descriptors: (*Agriculture, Mapping), (*Mapping, Agriculture), USSR

AD-626 257 Fld. 8/2
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
SCIENTIFIC-TECHNICAL CONFERENCE ON CARTOGRAPHY,
by I. B. Kostrits. 7 Apr 65, 3p. Rept. no. ACSI-I-6662B
TT 65-63532
Unclassified report

Naucho-Tekhnicheskaya Konferentsiya po Kartografii, trans. of Vsesoyuznoe Geograficheskoe Obshchestvo. Izvestiya (USSR) v96 n6 p536-7 1964.

Descriptors: (*Mapping, USSR), Maps, Symposia

AD-626 270 Fld. 8/2, 5/9
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
PRODUCTION TRAINING IN TOPOGRAPHIC TECHNICAL SCHOOLS (O PROIZVODSTVENNOM OBUCHENII V TOPOGRAFICHESKIKH TEKHNIKUMAKH),
by P. P. Sklyar, and A. I. Biryukov. 1965, 3p.
Rept. no. ACSI-I-7968 A
TT 66-60220
Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n4 p73-5 1964.

Descriptors: (*Mapping, USSR), Universities, Training, Teaching methods

AD-626 272 Fld. 8/2, 13/2
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
NEWS ITEMS (KHRONIKA).
1965, 4p. Rept. no. ACSI-I-7968-C
TT 66-60222
Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n4 p77-8 1964.

Descriptors: (*Surveying, Housing), Costs, Urban planning, Urban areas, Economics, Symposia, USSR

AD-626 274 Fld. 8/2
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
THE NATIONAL COUNCIL OF CARTOGRAPHERS OF THE USSR (NSK) AND INTERNATIONAL COOPERATION BY SOVIET CARTOGRAPHERS,
by A. P. Polezhaev. 30 Nov 65, 6p. Rept. no. ACSI-I-7843-A
TT 66-60223
Unclassified report

Natsionalnyi Sovet Kartografov SSSR (NSK) i Mezhdunarodnoe Sotrudnichestvo Sovetskih Kartografov. Trans. of Akademiya Nauk SSR. Izvestiya. Seriya Geograficheskaya n3 p122-5 1965.

Descriptors: (*Mapping, USSR), Scientific personnel, Scientific organizations

AD-626 285 Fld. 8/2
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
LOSSES TO SCIENCE: YU. V. FILIPPOV.
30 Nov 65, 2p. Rept. no. ACSI-I-7843-D
TT 66-60233
Unclassified report

Poteri Nauki: Yu. V. Filippov. Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya n3 p139 1965.

Descriptors: (*Mapping, Scientific personnel), (*Scientific personnel, USSR)

8/3. DYNAMIC OCEANOGRAPHY

AD-626 620 Fld. 8/3, 17/2.1
CFSTI Prices: HC $1.00 MF $0.50
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
OCEAN CURRENT DATA FROM A TELEMETRY BUOY.
Technical rept.,
by Robert G. Walden, Douglas C. Webb, and Robert M. Snyder. Dec 65, 24p. Rept. no. WHOI-Ref-65-65
Contract Nonr-2196 (00) Proj. NR-083-004
Unclassified report

Descriptors: (*Ocean currents, Measurement), (*Telemeter systems, Oceanographic equipment), Flowmeters, Buoys, Remote control systems, Data transmission systems, Oceanographic data

This report describes an experiment which was performed near Bermuda to obtain current speed and direction at several depths in the ocean and to telemeter this data, by radio, upon command to a shore station. Digital data from 10 current meters spaced at intervals of 10 meters to a depth of 100 meters along a buoy mooring line, was sampled every 30 minutes for approximately 100 hours. The data was received at a shore station where it was recorded on magnetic tape, reformatted and put on punched tape. Computer treatment of the data is discussed, current speed and direction values tabulated and relevant meteorological and oceanographic parameters presented. (Author)

8/4. GEOCHEMISTRY

AD-625 884 Fld. 8/4, 22/2
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
CONCERNING THE THEORY ON THE DETERMINATION OF THE EARTH'S FIGURE AND DIMENSIONS BY SATELLITE OBSERVATIONS,
by A. A. Izotov. Nov 65, 16p. Rept. no. TC-962
TT 66-60167
Unclassified report

K Teorii Opredeleniya Figury i Razmerov Zemli po Noblyudeniyam Iskusstvennykh Sputnikov. Technical trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Geodeziya i Aerofotosemka (USSR) n3 p3-11 1965.

Descriptors: (*Astronomical geodesics, Satellites (Artificial)), (*Satellites (Artificial), Astronomical geodesics), Geodesics, USSR

AD-626 020 Fld. 8/4, 8/11
PALMER PHYSICAL LAB PRINCETON UNIV N J
A GRAVIMETER TO MONITOR THE OSO DILATIONAL MODE OF THE EARTH.
Revised ed.,
by Rainer Weiss, and Barry Block. 30 Jul 65, 15p. Contract Nonr-1858 (30) Proj. NR-019-627
Unclassified report

Revision of manuscript submitted 12 Apr 65.

Availability: Published in Journal of Geophysical Research v70 n22 p5615-27 Nov 15 1965. Copies to DDC users only.

Descriptors: (*Gravity, Measurement), (*Geodesics, Gravity), (*Seismology, Gravity), Relativity theory, Geophysics

A gravimeter designed specifically to monitor the oSo dilational mode of the earth is described. The gravimeter is a modified LaCoste design constructed of fused quartz, operated in a high vacuum, and incorporated into an electrostatic null-seeking servo. The gravimeter data are digitally Fourier analyzed after passage through a heterodyne tide filter. The observed spectral density of the noise at 20-minute periods is 0.0000001 g/cpm. The noise can be attributed to temperature and tilt fluctuations and is not actual vertical earth noise. The purpose of the experiment is to search for evidence of scalar gravitational field radiation which may drive the oSo mode. (Author)

AD-626 070 Fld. 8/4
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
ON THE EXCLUSION OF ERRORS DUE TO RUN,
by N. A. Kutserib. Dec 65, 6p. Rept. no. fstc-381-T65-619
TT 66-60189
Unclassified report

Trans. of Geodezia i Kartografiya (USSR) May p16-7 1964.

Descriptors: (*Geodesics, Crections), Measurement, Errors, Optical instruments, USSR

AD-626 102 **See Fld. 8/7**

8/5. GEODESY

AD-626 011 **See Fld. 8/7**

AD-626 558 **See Fld. 7/2**

8/6. GEOGRAPHY

AD-625 879 Fld. 8/6
CFSTI Prices: HC $6.00 MF $1.25
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
EASTERN SIBERIA: ECONOMIC-GEOGRAPHIC CHARACTERISTICS BOOK 1,

by V. A. Krotov, M. I. Pomus, G. D. Rikhter, and V. B. Sochava. Nov 65, 202p. Rept. no. TC-861 TT 66-60162

Unclassified report

Trans. of mono. Vostochnaya Sibir: Ekonomiko-Geograficheskaya Kharakteristika, Moscow, 1963, p 13-78, 144-206, 236-301

Descriptors: (*Siberia, Geography), Economics, Natural resources, Transportation, Geology, Industries, USSR

Contents: Geographic position, territory, and boundaries; Natural conditions and resources, formation of the surface; The geological structure and useful minerals; Climate; Water areas; Growth of productive forces in Eastern Siberia during the years of Soviet rule; Population; Industry; Transportation.

AD-625 880 Fld. 8/6
CFSTI Prices: HC $5.00 MF $1.00
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
EASTERN SIBERIA: ECONOMIC-GEOGRAPHIC CHARACTERISTICS. BOOK 2. ECONOMIC AND GEOGRAPHIC REGIONS,
by V. A. Krotov, M. I. Pomus, G. D. Rikhter, and V. B. Sochava. Nov 65, 185p. Rept. no. TC-861 TT 66-60163

Unclassified report

Technical trans. of mono. Vostochnaya Sibir: Ekonomiko-Geograficheskaya Kharakteristika, Moscow, 1963 p365-609. See also AD-625 879.

Descriptors: (*Siberia, Geography), Economics, Natural resources, Transportation, Geology, Industries, USSR

AD-625 881 Fld. 8/6
CFSTI Prices: HC $5.00 MF $1.00
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
EASTERN SIBERIA: ECONOMIC-GEOGRAPHIC CHARACTERISTICS. PART 2, BOOK 3. ECONOMIC AND GEOGRAPHIC REGIONS,
by V. A. Krotov, M. I. Pomus, G. D. Rikhter, and V. B. Sochava. Nov 65, 197p. Rept. no. TC-861 TT 66-60164

Unclassified report

Technical trans. of mono. Vostochnaya Sibir: Ekonomiko-Geograficheskaya Kharacteristika, Moscow, 1963 p610-865. See also AD-625 880.

Descriptors: (*Siberia, Geography), Economics, Natural resources, Transportation, Geology, Industries, USSR

AD-626 220 Fld. 8/6, 6/3
CALIFORNIA UNIV BERKELEY
PLANTS, ANIMALS, AND MAN IN THE OUTER LEEWARD ISLANDS, WEST INDIES. AN ECOLOGICAL STUDY OF ANTIGUA, BARBUDA, AND ANGUILLA,
by David R. Harris. 1965, 184p.

Unclassified report

Availability: Univ. of California Press, Los Angeles, Calif. HC $5.00.

Descriptors: (*West Indies, Ecology), Geography, Humans, Animals, Plants (Botany), Forestry, Grasses, Climatology, Periodic variations, Rainfall, History

AD-626 246 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
MONGOLIAN LANDSCAPES (AS EXEMPLIFIED BY THE HENTEY MOUNTAINOUS REGION AND THE EASTMONGOLIAN ELEVATED PLAIN),
by Sh. Tsegmid. 1965, 6p. Rept. no. ACSI-I-8462-B TT 66-60203

Unclassified report

Trans. of mono. O Landshaftakh Mongolii (Na Primere Khenteiskogo Gornogo Raiona i Vostochno-Mongolskoi Pripodnyatoi Ravniny), n.p. n.d.

Descriptors: (*Outer Mongolia, Geography), Terrain, Ecology

AD-626 248 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
COORDINATION OF SCIENTIFIC RESEARCH. AN ALL-UNION CONFERENCE ON THE PROBLEMS INHERENT IN THE STUDY AND EXPLOITATION OF THE TAYGA. (KOORDINATSIYA NAUCHNYKH ISSLEDOVANIL VSESOYUZNOE SOVESHCHANIE PO PROBLEMAM IZUCHENIYA I OSVOENIYA TAYGI),
by B. N. Likhanov. 1965, 8p. Rept. no. ACSI-I-8462-D TT 66-60205

Unclassified report

Trans. from Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya, n2 1964.

Descriptors: (*Siberia, Forestry), (*Forestry, Siberia), Trees, Symposia, USSR

The reports submitted to the conference, in addition to the general reports dealing with the theoretical and practical problems involved in the study and exploitation of the taiga and the coordination of these operations, were grouped according to such large problems as forests and lumber, land exploitation, the all-round exploitation of the taiga, the physico-geographical problems involved in the exploitation of the taiga, the life and health of the population in the taiga zone, mapping the taiga, and the medical geography of the taiga. (Author)

AD-626 250 Fld. 8/6, 5/4, 5/3
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
SCIENTIFIC GEOGRAPHIC CONFERENCES IN HAVANA; TALLIN MEETING OF GEOGRAPHERS AND ECONOMISTS; ALL-UNION SESSION ON LAND ZOOGEOGRAPHY (3RD),
by B. N. Semevskii, M. Rostovtsev, B. Khorev, and A. N. Formozov. 30 Nov 65, 5p. Rept. no. ACSI-I-8462-G TT 66-60208

Unclassified report

Nauchnye Geograficheskie Konferentsii v Gavane; Tallinskoe Soveshchanie Geografov i Ekonomistov; Trete Vsesoyuznoe Soveshchanie po Zoogeografii Suchi. Trans. of Akademiya Nauk SSSR Izvestiya. Seriya Geograficheskaya n2 p168-9 1964, and additional selected articles.

Descriptors: (*Geography, Symposia), (*Cuba, Geography), (*Europe, Geography), Political science, Economics, Government (Foreign), Industries, Agriculture, Population, USSR

AD-626 251 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
CONFERENCE ON THE UTILIZATION OF THE NATURAL RESOURCES IN THE LEFT-BAND AREA OF THE UKRAINE (EAST OF THE DNIEPER RIVER). (KONFERENTSIYA PO ISPOL'ZOVANIU PRIRODNYKH RESURSOV LEVOBEREZHNOI UKRAINII),
by A. A. Velichko. 1965, 3p. Rept. no. ACSI-I-8462-F TT 66-60209

Unclassified report

Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n2 1964.

Descriptors: (*Natural resources, USSR), (*Labor, USSR), Symposia, Rivers, Industries, Agriculture, Economics

The conference was devoted to a study of the natural and labor resources, the distribution of industry and agriculture in eastern Ukraine and their utilization. (Author)

AD-626 253 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
FOURTH CONGRESS OF THE GEOGRAPHIC SOCIETY OF THE USSR (CHETVERTYI S'EZD GEOGRAFICHESKOGO OBSHCHESTVA SSSR).
1965, 4p. Rept. no. ACSI-I-8559-A TT 66-60211

Unclassified report

Trans. of Moscow Univ. Vestnik (USSR) v19 n3 p3-6 1964.

Descriptors: (*Geography, USSR), Scientific organizations, Symposia, State-of-the-art reviews

AD-626 254 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
CERTAIN RESULTS OF SCIENTIFIC RESEARCH BY THE GEOGRAPHY DEPARTMENT OF THE MOSCOW UNIVERSITY IN 1963 (NEKOTORYE ITOGI NAUCHNOISSLEDOVATEL'SKOIRABOTI GEOGRAFICHESKOGO FAKUL'TETA MOSKOVSKOGO UNIVERSITETA V 1963 GODY).
1965, 4p. Rept. no. ACSI-I-8559-C TT 66-60212

Unclassified report

Trans. from Moscow Univ. Vestnik (USSR) v19 n3 1964.

Descriptors: (*Geography, USSR), Universities, Research program administration, Scientific research, Education

In 1963 the faculty organized more than 20 expeditions to the Extreme North, the non-Black Soil region of the European part of the USSR, the Volga region, the Ukraine, the Caspian region, the Caucasus, the Ural region, Kazakhstan, Eastern Siberia and the Far East. The expeditions' operations were accompanied by experimental studies of physico-geographic processes, the development of new types of maps and atlases, new methods of geographic research and new textbooks for universities in the various departments and laboratories of the faculty.

AD-626 255 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
IN THE LEARNED COUNCIL OF THE GEOGRAPHY DEPARTMENT (V UCHENOM SOVETE GEOGRAFICHESKOGO FAKUL'TATA),
by L. I. Grishina. 1965, 1p. Rept. no. ACSI-I-8559-D TT 66-60213

Unclassified report

Trans. from Moscow Univ. Vestnik (USSR) v19 n3 1964.

Descriptors: (*Geography, USSR), Education, Universities, Awards, Scientific personnel, Scientific research

A brief account is presented of a doctoral thesis on 'The hypergenesis of the Quatenary period and its geographic aspects'. The dissertation is based on a comparative geographic study of the physicogeographic conditions of the USSR, from the tundra to the desert. The vast amount of factual information obtained by combining the field investigations with the latest methods of analytical research has enable the author of the thesis to establish the basic features of the hypergenesis in the quatenary period in the European part of the USSR, Kazakhstan and Central Asia, and ascertain the characteristics of the hypergenic evolution in various regions.

AD-626 256 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
INTERNATIONAL GEOGRAPHIC CONGRESS (NO. 20),
by S. V. Kalesnik. 7 Apr 65, 2p. Rept. no. ACSI-I-6662A
TT 65-63531

Unclassified report

Mezhdunarodnyi Geograficheskii Kongress (no. 20), trans. of Vsesoyuznoe Geograficheskoe Obshchestvo. Izvestiya (USSR) v96 n6 p535-6 1964.

Descriptors: (*Geography, Symposia), Scientific organizations

The work of the Congress (London 20-28 July 1964) took place in ten sections: (1) the geography of population and of populated places; (2) economic geography; (3) climatology; hydrology; oceanography and glaciology; (4) biogeography; (5) geomorphology; (6) historical geography; (7) applied geography; (8) regional geography; and (9) cartography.

AD-626 263 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
CONFERENCE ON MODERN WAYS AND METHODS OF STUDYING SWAMPS,
by M. Neishtadt, and N. Khotinskii. 13 Dec 65, 6p. Rept. no. ACSI-I-7964-A
TT 66-60216

Unclassified report

Soveshchanie po Sovremennym Putyam i Metodam Izucheniya Bolot, trans. of Akademiaya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n3 p139-42 1965.

Descriptors: (*Swamps, USSR), Geography, Hydrology

The Conference worked in the following directions: questions of physical geographical paludology; regional investigations of the USSR bogs; peat formation processes, types of peats and peat-beds; age of bogs; indicative researches on bogs; physics and chemistry of peat; hydro-meterological investigations of bogs; and study of bogs in connection with civil engineering.

AD-626 264 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
SCIENTIFIC EXPLORATION BY YOUNG SIBERIAN GEOGRAPHERS,
by V. S. Mikheev, and B. B. Prokhorov. 7 Apr 65, 5p. Rept. no. ACSI-I-6662C
TT 65-63533

Unclassified report

Nauchnyi Poisk Molodykh Geografov Sibiri, trans. of Vsesoyuznoe Geograficheskoe Obshchestvo. Izvestiya (USSR) v96 n6 p537-40 1964.

Descriptors: (*Geography, Siberia), Symposia, USSR

AD-626 275 Fld. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
ANNIVERSARY OF I. S. SHCHUKIN, ANNIVERSARY OF K. K. MARKOV,
by Yu. G. Somonov, A. A. Velichko, S. Yu. Geller, I. P. Gerasimov, and V. P. Grichuk. 30 Nov 65, 5p. Rept. no. ACSI-I-7834-B
TT 66-60224

Unclassified report

Yubilei I. S. Shchukina, Yubilei K. K. Markova. Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya n3 p136-8 1965.

Descriptors: (*Georgraphy, Scientific personnel), (*Scientific personnel, USSR), Glaciers, Paleontology, Geology

The well-known naturalist and geographer Ivan Semenovich Shchukin accomplished much for the development of geomorphology. Konstantin Konstantinovich Markov conducted basic theoretical investigations in the fields of physical geography, geomorphology, glaciology and especially the paleogeography of the Quaternary Period. K. K. Markov invariably substantiated and checked concepts of a general theoretical nature with the results of regional field investigations, conducted in the most varied parts of the Soviet Union and abroad.

AD-626 276 Fld. 8/6, 6/3
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
THE ALL-UNION CONFERENCE ON TOPONYMICS (1ST), INTER-VUZ CONFERENCE ON GEOBOTANICAL ZONING OF USSR, CONFERENCE ON THE GEOGRAPHY OF THE FERTILITY OF FOREST TREES, BRUSHWOODS AND BERRY BUSHES,
by E. M. Pospelov, L. N. Sobolev, V. V. Barykinaand , and Yu A. Isakov. 30 Nov 65, 12p. Rept. no. ACSI-I-7843-C
TT 66-60225

Unclassified report

Pervaya Vsesoyuznaya Konferentsiya pe Toponimike, Mezhbusovskaya Konferentsiya po Geobotanicheskomu Raionirvanirbaniyu SSSR, Soveshchanie po Voprosam Geografii Plodonosheniya Lesnykh Drevesnykh Porod, Kustarnikov i Yagodnikov. Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya n3 p142-9 1965.

Descriptors: (*Geography, USSR), (*Plants (Botany), USSR), Ecology, Natural resources, Symposia

AD-626 500 Fld. 8/6, 14/2
CFSTI Prices: HC $5.00 MF $1.00
PURDUE UNIV LAFAYETTE IND ENGINEERING EXPERIMENT STATION
TERRAIN STUDY OF THE YUMA TEST STATION AREA ARIZONA,
by James R. Shepard, James G. Johnstone, Alton A. Lindsey, Robert D. Miles, and Robert E. Frost, Mar 55, 188p. Contract DA-22-079-eng-134 Proj. DA-8-97-10-004

Unclassified report

Descriptors: (*Desert tests, Test facilities), (*Test facilities, Desert tests), (*Deserts, Arizona), Geography, Terrain, Ecology, Mapping, Military facilities, Site selection

Twenty-six per cent of the Yuma Test Station Area consists of mountains, most of which are rugged and difficult to traverse. Hills comprise 17 per cent of the Test Station Area. The terrain is rolling to rough, although local elevation differences are usually not great. Plains make up fifty-seven per cent of the Test Station Area and provide the most suitable locations for most of the various activities that are being conducted at the Test Station. Forty-four per cent of the total area is alluvial aprons. Much of the surface consists of desert pavement, a firm mosaic of pebbles that make a smooth surface. Desert varnish is a dark coating that has formed on exposed rock surfaces, both pebbles and bedrock. Except on the floodplains and along the washes, vegetation is very sparse in the area. In the opinion of most of the personnel of the test teams that were interviewed, environmental conditions at the Yuma Test Station offer conditions that are suitable for conducting most of the desert testing programs. (Author)

AD-626 567 Fld. 8/6, 6/6
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
LANDSCAPE RELATIONSHIPS OF SOILS AND VEGETATION IN THE FOREST-TUNDRA ECOTONE, UPPER FIRTH RIVER VALLEY, ALASKA-CANADA,
by James V. Drew, and Royal E. Shanks. Jan 65, 24p. Contract Nonr-1138 (01) Proj. NR-307-105

Unclassified report

Prepared in cooperation with Nebraska Univ., Lincoln, Dept. of Agronomy and Tennessee Univ., Knoxville, Dept. of Botany.

Availability: Published in Ecological Monographs v35 n3 p285-306 1965. Copies to DDC users only.

Descriptors: (*Soils, Ecology), (*Plants (Botany), Ecology), (*Ecology, North America), Alaska, Canada, Geography

AD-626 265 See Fld. 2/4

AD-626 266 See Fld. 2/4

AD-626 462 See Fld. 13/2

8/7. GEOLOGY AND MINERALOGY

AD-625 763 Fld. 8/7
SOUTHERN METHODIST UNIV DALLAS TEX DEPT OF GEOLOGY AND GEOPHYSICS
COMPARISON OF STATIC AND DYNAMIC MEASUREMENTS OF COMPRESSIBILITY OF ROCKS,
by Gene Simmons, and W. F. Brace. 12 Jul 65, 9p. Contract AF19 (628)-3298 Grant, AF-AFOSR-418-63

Unclassified report

Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Dept. of Geology and Geophysics.

Availability: Published in Journal of Geophysical Research, v70 n22 p5649-56 15 Nov 1965. Copies to DDC users only.

Descriptors: (*Rock (Geology), Compressive properties), (*Petrology, High-pressure research), Loading (Mechanics), Statics, Dynamics, Elasticity

The elastic properties of several rocks, fused quartz, aluminum, and steel were calculated as a function of pressure to 10 kb from measured velocities of P and S waves in three directions. Compressibility calculated from Vp and Vs is within a few per cent (and therefore within the experimental error) of that measured directly by the use of strain gages, for pressures which range from 3 to 9 kb. Comparison is also good for fused quartz, steel, and aluminum, as well as for fine-grained limestone at atmospheric pressure. At atmospheric pressure a discrepancy of several hundred per cent between static and dynamic values is probably due to the different effects of cracks in the rocks on the two measurements. The good agreement of the two sets of compressibilities at pressures greater than 2 kb implies that other elastic properties calculated from velocities will be in good agreement with static values. (Author)

AD-626 011 Fld. 8/7, 8/5, 8/10
CFSTI Prices: HC $1.00 MF $0.50
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
SEPIOLITE AND CLINOPTILOLITE FROM THE MIDATLANTIC RIDGE.
Technical rept.,
by John C. Hathaway, and Peter L. Sachs. Dec 65, 20p. Rept. no. Ref-65-64
Contract Nonr-2196 (00) ,AT (30-1)-3010 Proj. NR-083-004

Unclassified report

Descriptors: (*Petrology, Marine geology), (*Economic geology, Atlantic Ocean), (*Atlantic Ocean, Minerals), (*Minerals, Atlantic Ocean), Geochemistry, Ocean bottom sampling, Magnesium compounds, Silicon compounds, Oxides

Sepiolite has been found in samples dredged from the Mid-Atlantic Ridge. The mineral is intimately associated with laminated clay and coccolith ooze, both containing clinoptilolite; one sample contained chert. Serpentine was recovered in the same dredge, but the sepiolite seems to have formed by the reaction of Mg in solution with SiO2 liberated during alteration of silicic volcanic ash, rather than by direct alteration of the serpentine. (Author)

AD-626 102 Fld. 8/7, 8/4
OSSERVATORIO GEOFISICO SPERIMENTALE TRIESTE (ITALY)
BULLETIN OF GEOPHYSICS, THEORY AND APPLICATION, V7 N27 P179-251 SEP 65.
1965, 86p.

Unclassified report

Availability: Published in Bollettino di Geofisica Teorica ed Applicata (Italy) v7 n27 p179-251 Sep 1965. Copies to DDC users only.

Descriptors: (*Geophysics, Periodicals), Gravity, Geodesics, Geology, Italy

AD-626 103 Fld. 8/7
OSSERVATORIO GEOFISICO SPERIMENTALE TRIESTE (ITALY)
CARATTERISTICHE STRUTTURALI DELLA ZONA FRA MONFALCONE ED IL TIMAVO,
by Carlo D'Ambrosi, and Ferruccio Mosetti.
1964, 6p.

Unclassified report

Availability: Published in Rassegna di Problemi Italiani, n5|6 p3-7 1965.

Descriptors: (*Geology, Italy), Structural geology, Seacoast, Adriatic Sea, Hydrology, Industries, Site selection

L'area pianeggiante compresa fra la baia di Panzano, attuale porto de Monfalcone, e le foci del Timavo, delimitata a sud dalla linea di costa e dai contrafforti del Carso verso nord-est, presenta notevoli interessi sia per le prospettive di sviluppo legate alla tendenza all'industrializzazione del Monfalconese, sia per le sue peculiari caratteristiche fisiche dovute a terreni di buona consistenza e ad una straordinaria abbondanza di acqua sfruttabile industrialmente. (Author)

AD-626 113 Fld. 8/7, 20/1
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF GEOLOGY AND GEOPHYSICS
ULTRASONICS IN GEOLOGY,
by Gene Simmons. 5 Jul 65, 10p. Contract AF-AFOSR-418-65

Unclassified report

Availability: Published in The Proceedings of the IEEE, v53 n10 p1337-45 Oct 1965. Copies to DDC users only.

Descriptors: (*Geophysical prospecting, Ultrasonic radiation), (*Petrology, Ultrasonic radiation), (*Ultrasonic radiation, Geophysical prospecting), Rock (Geology), Minerals, Elasticity, Measurement, Solid state physics

Ultrasonics is used in geology for the determination of elastic properties of rocks and minerals. For measurements on rocks, techniques with precisions of a few percent have come into use; these measure delay times of elastic waves propagating through specimens several inches long. For single crystals, the techniques are the same as those used in solid-state physics; they are basically interferometric methods. Techniques of measurement are reviewed. An extensive bibliography is included. (Author)

AD-626 249 Fld. 8/7
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
IN THE INTERNATIONAL SCIENTIFIC ORGANIZATIONS. AN INTERNATIONAL PALEONTOLOGICAL COLOQIUM ON THE PLEISTOCENE, AND A GEOMORPHOLOGICAL FIELD TRIP THROUGH THE GERMAN DEMOCRATIC REPUBLIC. (V MEZHDUNARODNYKH NAUCHNYKH ORGANIZATSIYAKH. MEZHDUNARODNII PALEONTOLOGICHESKII KOLLOKVIUM PO PLEISTOTSINU I GEOMORFOLOGICHESKAYA EKSKURSIYA PO TERRITORII GDR),
by N. S. Chebotareva. 1965, 16p. Rept. no. ACSI-I-8462-E
TT 66-60207

Unclassified report

Trans. from Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n2 1964.

Descriptors: (*Paleontology, Europe), (*Geological survey, East Germany), Stratigraphy, Glaciers, Symposia, Scientific organizations

AD-626 431 Fld. 8/7
CFSTI Prices: HC $2.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
GRABEN-LIKE TRENCHES IN THE EAST OF THE RUSSIAN PLATFORM,
by V. D. Nalivkin. Feb 65, 39p. Rept. no. T-400-R
TT 66-60237,NCH ,NCH 200 290 canceled

Unclassified report

Trans. of Sovetskaya Geologiya (USSR) v6 n1 p40-52 1963. Also available from NRC as C-5317.

Descriptors: (*Geology, USSR), Structural geology, Folds (Geology), Faults (Geology), Maps

AD-626 447 Fld. 8/7
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
CAUSES OF CRUSTAL MOVEMENTS: DEEP GRAVITATIONAL TECTOGENESIS,
by A. I. Rybin. Oct 64, 10p. Rept. no. T-414-R
TT 65-40747

Unclassified report

Trans. of Priroda (USSR) v53 n7 p87-91 1964. Also available from NRC as C-5101.

Descriptors: (*Orogeny, Isostatic change), (*Isostatic change, Orogeny), Gravity, Structural geology, Theory, USSR

8/8. HYDROLOGY AND LIMNOLOGY

AD-625 918 Fld. 8/8
CFSTI Prices: HC $4.00 MF $0.75
COORDINATING COMMITTEE ON GREAT LAKES BASIC HYDRAULIC AND HYDROLOGIC DATA
LAKE ERIE OUTFLOW 1860-1964.
Jun 65, 128p.

Unclassified report

Descriptors: (*Great Lakes, Drainage), (*Hydrology, Great Lakes), Rivers, Fluid flow, Volume, Tables

The purpose of this report is to document the Lake Erie outflow studies and to record the outflows which were derived for the period 1860-1964 for the information of the responsible Federal agencies in Canada and the United States. The Coordinating Committee terminated its Lake Erie outflow studies with the year 1964 with the understanding that the responsible Federal agencies of the United States and Canada would continue the derivation and coordination of the outflows subsequent to that year.

AD-626 151 Fld. 8/8, 18/3, 13/2
CFSTI Prices: HC $2.00 MF $0.50
HAZLETON-NUCLEAR SCIENCE CORP PALO ALTO CALIF EARTH SCIENCES DIV
GROUND WATER SAFETY.
Final rept.
1 Oct 65, 25p.
ARPA VUF-1027,TID ,TID 4500-46TH-ED.

Unclassified report

Rept. on Vela Uniform, Project DRIBBLE, Salmon Event, Tatum Salt Dome, Miss., 22 Oct 64.

Descriptors: (*Water supplies, Radiological contamination), (*Nuclear explosions, Underground explosions), (*Radiological contamination, Water supplies), Geology, Hydrology, Environment, Sampling, Drilling, Radioactive decay, Radioactivity, Safety

Evaluations, predictions, and recommendations for ground-water safety were made for the 5 kiloton Salmon Event, Project Dribble. Pre-shot consideration indicated that the nuclear explosion would be fully contained within the salt mass of Tatum Dome, enabling the conclusion that radiocontamination of aquifers intersecting or overlying Tatum Dome would not occur. In the unlikely event that contaminants were introduced into aquifers it was estimated that contaminant movement within the aquifers would be limited to a maximum lateral distance of about 700 meters from the point of insertion before reduction to acceptable concentrations by radioactive decay. Recommendations were included to examine several lines of shot and post-shot evidence to evaluate the possibility of ground-water contamination as a result of the detonation. The shot and post-shot data indicate that the Salmon underground nuclear event was essentially contained within the salt matrix of Tatum Dome and no explosion radioactivity has been detected in the aquifers. Recommendations are made for future sampling and monitoring of all aquifers previously considered to assure continuing ground-water safety. (Author)

8/9. MINING ENGINEERING

AD-626 271 Fld. 8/9, 5/9
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
FOURTH INTERNATIONAL CONFERENCE OF TRADE UNIONS OF THE MINING INDUSTRY WORKERS (MEZHDUNARODNAYA KONFERENTSIYA PROFSOYUZOV TRUDYASHCHIKHSYA GORNOI PROMYSHLENNOSTI),
by A. I. Smirnov. 1965, 2p. Rept. no. ACSI-I-7968-B
TT 66-60221

Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n4 p75-6 1964.

Descriptors: (*Labor unions, Mining engineering), (*Mining engineering, Symposia), USSR

8/10. PHYSICAL OCEANOGRAPHY

AD-625 861 Fld. 8/10
CFSTI PricesMF $1.75
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C
OCEANOGRAPHIC ATLAS OF THE NORTH ATLANTIC OCEAN, SECTION V, MARINE GEOLOGY.
1965, 68p. Rept. no. Pub. 700
Unclassified report

Availability: Available from U. S. Naval Oceanographic Office, Washington, D. C. 20390, $2.00.

Descriptors: (*Atlantic Ocean, Marine geology), (*Marine geology, Atlantic Ocean), Terrestrial magnetism, Seismology, Ocean bottom topography, Maps

This atlas is a compilation of published and unpublished data concerning the oceanography of the North Atlantic Ocean. Section V contains data on marine geology. (Author)

AD-625 877 Fld. 8/10
CFSTI Prices: HC $2.00 MF $0.50
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
A REPORT CONCERNING DATA OBTAINED JULY 1964-JUNE 1965.
Annual rept. Jul 64-June 65,
by Saul Broida, and Lucile Buie. Oct 65, 29p.
Rept. no. 65-3 ,ML-65306
Contract Nonr-4008 (02)
Unclassified report

Descriptors: (*Oceanology, Tropical regions), Atlantic Ocean, Caribbean Sea, Oceanographic data, Seacoast, Florida

The report contains a list of all oceanographic lowerings made aboard research vessels of the Institute of Marine Science, University of Miami for the period July 1964 June 1965. Geographical positions, cruise dates, and type of observation are listed in chronological order. The data are not presented, but are available to interested researchers. (Author)

AD-626 010 Fld. 8/10
CFSTI Prices: HC $1.00 MF $0.50
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
THE VOLUME TRANSPORT OF THE NORWEGIAN SEA OVERFLOW WATER IN THE NORTH ATLANTIC.
Technical rept.,
by L. V. Worthington, and G. H. Volkmann. Dec 65, 15p. Rept. no. Ref-65-63
Contract Nonr-2196 (00) Proj. NR-083-004
Unclassified report

Descriptors: (*Norwegian Sea, Ocean currents), (*Atlantic Ocean, Ocean currents), Volume, Fluid flow, Oceanology

Direct measurements with Swallow floats and anchored current meters were made at a point near 53N, 36W where overflow water from the Norwegian Sea passes through a gap in the Mid-Atlantic Ridge from the eastern basin of the North Atlantic into the Labrador Basin. Dynamic computations accompanying the direct measurements gave a westward volume transport of overflow water in the amount of 4.6 million cubic m/sec. The volume transport of the same overflow water is computed elsewhere in the North Atlantic using the motionless surface suggested by the potential temperature/salinity relationship and the average current measurement and is found to be irregular, varying between 2.0 and 7.6 million cubic m/sec. (Author)

AD-626 025 Fld. 8/10
LOCKHEED-CALIFORNIA CO BURBANK
SPECTRA OF TEMPERATURE FLUCTUATIONS OVER
by A. J. Carsola, D. P. Hamm, and J. C. Roque.
26 Apr 65, 7p. Contract Nonr-3348 (00)
Unclassified report

Availability: Published in Deep-Sea Research v12 p685-91 1965. Copies to DDC users only.

Descriptors: (*Pacific Ocean, Bathythermograph data), (*San Diego Bay, Bathythermograph data), (*Bathythermograph data, Pacific Ocean), Sea water, Temperature, Seacoast, California

AD-626 409 Fld. 8/10, 20/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
DEEP-SEA LIGHT ATTENUATION MEASUREMENTS AT 2,000-METER DEPTHS,
by Gary D. Gilbert. Dec 65, 24p. Rept. no. NOTS-TP-3994
Unclassified report

Descriptors: (*Light transmission, Underwater), (*Sea water, Light transmission), (*Underwater light, Attenuation), (*Photometers, Oceanographic equipment), Underwater equipment, Oceans, Optical properties

The null-balance transmissometer (NBT) is an instrument being developed to measure the volume attenuation coefficient of light in the sea to depths of 2,000 meters. In earlier tests (AD-613 017), the operation of the NBT was tested in its working environment to depths of 700 meters. In this report, the first deep sea tests of the NBT, in which measurements were made to the 2,000-meter maximum depth capability of the instrument, are documented. The tests were conducted at 10 locations in the North Pacific from the Aleutian Islands to the island of Oahu in the Hawaiian Archipelago. (Author)

AD-626 548 Fld. 8/10
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
SUBMARINE CANYONS EXPLORED BY COUSTEAU'S DIVING SAUCER,
by F. P. Shepard. 5 Jan 66, 14p. Contract Nonr-2216 (23) Grant ,NSF-GP-3601 Proj. NR-083-005
Unclassified report

Availability: Published in Proceedings of Symposium Colston Research Society Univ. of Bristol v17 p303-11 Apr 5-9 1965. Copies to DDC users only.

Descriptors: (*Ocean bottom topography, Pacific Ocean), Marine geology, Seacoast, California, Exploration, Submarines

Submarine canyons offshore from La Jolla, California, and Cape San Lucas, Lower California, have been explored by the dving saucer down to depths of about 1000 ft. Vertical walls extend through the whole length of the Scripps Canyon and in the La Jolla Canyon large blocks from rockfalls strew the floor. San Lucas Canyon has steep slopes and some vertical walls. Repeated dives to the same place show that the sediment on the floor of the canyons may change in a short time, as in a few weeks or months: a floor covered with organic debris may later be swept clean only subsequently to be covered with sand: a muddy floor may change into a sandy one. Currents in the canyons are variable but sometimes they transport sand: they explain the presence of sand and shallowwater organisms in the deeper parts and turbidity currents need not be invoked on this basis alone. (Author)

AD-626 575 Fld. 8/10, 18/8
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
OCEANOGRAPHIC IMPLICATIONS OF RADIOACTIVE FALL-OUT DISTRIBUTIONS IN THE ATLANTIC OCEAN: FROM 20 DEGREES NORTH TO 25 DEGREES SOUTH, FROM 1957 TO 1961,
by Vaughan T. Bowen, and Thomas T. Sugihara.
9 Apr 65, 24p. Contract AT (30-1)-2174 ,Nonr-1238 (00)
Unclassified report

Prepared in cooperation with Clark Univ., Worcester, Mass.

Availability: Published in Journal of Marine Research v23 n2 p123-46 1965. Copies to DDC users only.

Descriptors: (*Radioactive fallout, Atlantic Ocean), (*Atlantic Ocean, Radioactive fallout), Radioactive isotopes, Distribution, Radiochemistry, Oceanographic data

The patterns of Sr (90) distribution in the equatorial Atlantic are described for the years 1957, 1958, 1960, and 1961. Evidence is drawn from analysis of surface samples and of vertical profiles. The concentration distributions bear no resemblance to patterns of fall-out delivery on land; it is concluded that hydrographic processes are responsible for seawater concentration patterns. The data provide evidence for two otherwise unobserved, high fall-out incidents over the Atlantic Ocean. The rapid vertical penetration of Sr (90) in the ocean, and the relatively rapid attainment of horizontal and vertical uniformity of concentration in the equatorial Atlantic are consistent with patterns of current flow derived from hydrographic considerations, only if these are complicated by very active unoriented mixing processes within water masses. Integration of vertical profiles yields estimates of fall-out delivery to the equatorial ocean surface that are much higher than estimates of delivery to land surfaces at comparable latitudes. Vertical profiles of Ce (144) and Pm (147) show secondary concentration maxima at various depths; some of these maxima are interpreted as being local concentrations of sinking particles whereas others appear to represent retention in the bodies of plankton swarms. In most cases these secondary maxima are enriched in Pm (147) vs. Ce (144). (Author)

AD-625 950 See Fld. 14/2

AD-626 011 See Fld. 8/7

AD-626 547 See Fld. 7/2

AD-626 558 See Fld. 7/2

8/11. SEISMOLOGY

AD-625 677 Fld. 8/11
ARCTIC INST OF NORTH AMERICA MONTREAL (QUEBEC)
VARIATIONS IN SHORT-PERIOD RECORDS FROM CANADIAN SEISMOGRAPH STATIONS.
Scientific rept.,
by M. Ichikawa, and P. W. Basham. 1 May 65, 37p. Contract AF-AFOSR-62-453 ,ARPA Order-292-62
Unclassified report

Availability: Published in Canadian Journal of Earth Sciences v2 p510-42 1965. Copies to DDC users only.

Descriptors: (*Seismological stations, Canada), Seismic waves, Lithosphere, Seismographs, Sensitivity, Signalto-noise ratio

A study of the relative recording ability of some of the Canadian seismograph stations has indicat-

ed a pattern of P-wave amplitude anomalies varying from station to station and, at any one station, showing a significant regional variation which does not seem to be entirely produced by source mechanism effects. Rather local crustal effects appear important, and spectral studies indicate that significant effects can be produced in low velocity upper crustal layers. The initial investigation of early P-wave trains and theoretical models suggests that these crustal effects can best be examined by the use of apparent incident angles, and that spectral amplitude decrements change significantly from station to station, although this is unexplained. It appears that the different recording ability of stations can be explained by a combination of shallow crustal effects operating on the signal amplitude and the local noise properties. (Author)

AD-625 684 Fld. 8/11
CALIFORNIA UNIV LOS ANGELES INST OF GEOPHYSICS AND PLANETARY PHYSICS
SCATTERING OF LOVE WAVES BY A CONSTRICTION IN THE CRUST.
Revised ed.,
by A. K. Mal, and I. Herrera. 21 Jul 65, 9p. Contract AF-AFOSR-710-64
Unclassified report

Revision of manuscript submitted 29 May 65.

Availability: Published in Journal of Geophysical Research v70 n20 p5125-33 Oct 15 1965. Copies to DDC users only.

Descriptors: (*Seismic waves, Scattering), (*Lithosphere, Seismology), (*Seismology, Lithosphere), Structural geology

A perturbation technique is applied to a study of the propagation of Love waves in a layer of nonuniform thickness lying over a half-space. The layer is assumed to have a plane free surface while the interface protrudes into it in a certain finite region. Love waves are generated by a point source on the free surface of the crust at a distance from the inhomogeneity. A simple but rigorous derivation is given for the scattering of the waves incident at the inhomogeneity. The theory is applicable for any shape of the inhomogeneity. Numerical calculations for the particular case in which the height of the perturbation is constant throughout a finite length indicate mode conversion in the constricted region. There is essentially a phase shift in the same mode; the superposition of the converted modes, however, gives rise to amplitude perturbation in every mode. The results are fairly accurate as long as the height of the inhomogeneity is small in comparison with the wavelength of the incident waves. By suitable interpretation of the results, the theory is extended to include the case in which the area of the perturbed region is large. Although only the scalar problem has been considered, the theory can be extended to treat the vector case without much difficulty. (Author)

AD-625 817 Fld. 8/11, 20/5
CFSTI Prices: HC $1.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
A REVIEW OF LONG-RANGE EARTH STRAIN MEASUREMENT TECHNIQUES FOR PROVIDING EARTHQUAKE WARNING.
Technical note,
by E. Gehrels. 13 Dec 65, 23p. Rept. no. TR-1965-62
Contract AF19 (628)-5167 ,ARPA Order-512
ESD TDR-65-564
Unclassified report

Descriptors: (*Earthquake warning systems, Strain (Mechanics)), (*Strain (Mechanics), Measuring devices (Electrical + electronic)), (*Lasers, Earthquake warning systems), Interferometers, Phase measurement, Microwave frequency, Light, Modulation

One of the most valuable tools for studying earthquakes and faults is earth strain or displacement measurements. Geologists are now looking for minute telltake displacements that might occur before an earthquake. This report discusses the possible accuracies that might be achieved by three different electromagnetic measurement techniques: (1) Microwave phase measurements, (2) Modulated light beams, and (3) Laser interferometers. The first is extremely sensitive to propagation errors. The second can achieve a modest degree of accuracy, 10 to the -7th power or better, and will clearly meet the minimum requirements. The third will provide by far the greatest degree of accuracy for propagation path lengths over which at least a partial degree of coherence of the wave front can be maintained. (Author)

AD-625 850 Fld. 8/11
CFSTI Prices: HC $1.00 MF $0.50
DEPARTMENT OF THE NAVY WASHINGTON D C
THE POSSIBILITY OF USING DEPTH EXPLOSIONS DURING SEISMIC STUDIES AT SEA BY THE METHOD OF REFLECTED WAVES IN DEEP WATER AREAS,
by Yu. P. Neprochnov. 1965, 6p. Rept. no. Translation-2023
TT 66-60156
Unclassified report

Trans. of Okeanologiya (USSR) v4 n3 p512-6 1964.

Descriptors: (*Seismology, Underwater explosions), (*Underwater explosions, Seismology), Acoustics, Marine geophysics, USSR

AD-625 926 Fld. 8/11
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
OSCILLATIONS OF THE EARTH: NEW CORE-MANTLE BOUNDARY MODEL BASED ON LOW-ORDER FREE VIBRATIONS.
Scientific rept.,
by James Dorman, Jerome Ewing, and L. E. Alsop. 10 Jun 65, 10p. Rept. no. LGO-814, Scientific- 2
Contract AF19 (628)-4082 ,ARPA Order-292
Proj. AF-8652 Task 865203
AFCRL 65-793
Unclassified report

Availability: Published in Proceedings of the National Academy of Sciences v54 n2 p264-8 Aug 1965. Copies to DDC users only.

Descriptors: (*Seismology, Earth models), (*Earth (Planet), Oscillation), Geophysics

Periods of the spheroidal oscillations of orders 3-9 exceed the corresponding theoretical periods for a standard earth model by an amount greater than the standard deviation of each observation. The same discrepancy is not as conspicuous in the torsional oscillations, though it exists for orders 3 and 4. The spheroidal and torsional periods of order 2 are so poorly defined experimentally that they do not exceed the respective theoretical values by a significant amount. A slightly larger core, surrounded by a thin soft layer at the base of the mantle, can explain the discrepancy in a way which is consistent with pertinent data on seismic body waves. Calculated theoretical free periods for an earth model based on these concepts are closer to the observed values than are the calculated periods for the standard Gutenberg-Bullen A earth model. (Author)

AD-625 959 Fld. 8/11
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
OBSERVED ATTENUATION AND Q VALUES OF SEISMIC SURFACE WAVES IN THE UPPER MANTLE.
by Ari Ben-Menahem. 29 Jun 65, 12p. Contract AF49 (638)-1337
Unclassified report

Revision of manuscript submitted 16 Apr 1965.

Availability: Published in Journal of Geophysical Research v70 n18 p4641-51 15 Sep 1965. Copies to DDC users only.

Descriptors: (*Seismic waves, Attenuation), Seismology, Earthquakes, Lithosphere

Attenuation coefficients and Q values of Love and Rayleigh waves in the period range 50-330 sec have been derived from the amplitude spectrums of these waves. Data were obtained from surface wave signals of twelve earthquakes recorded at Pasadena and some other USCGS standardized stations on a variety of seismographs. The resulting absorption parameters, as determined from all seismic events, show a mean scatter of about 10%. Nevertheless, data from each event indicate a systematic higher attenuation (lower Q) for Love waves than for Rayleigh waves. The attenuation coefficients for both waves tend to increase almost linearly with frequency, and the corresponding Q functions are slowly varying in the period range 50-150 sec, with mean values QL = 105 and QR = 145. In contradistinction to the phase velocities, there is not evidence yet for a persistent difference in attenuation of mantle surface waves under oceans and continents. (Author)

AD-625 966 Fld. 8/11
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH TRIANGLE INST DURHAM N C
RESEARCH DIRECTED TOWARD THE STUDY OF SEISMICITY IN THE SOUTHEASTERN UNITED STATES.
Annual technical rept., no. 2,
by John W. Minear. 5 Jan 66, 35p. Contract AF19 (628)-3892 ,ARPA Order-292 Proj. VELA-UNIFORM ,RTI-GU-163 Task 810002
Unclassified report

Descriptors: (*Seismology, North Carolina), (*Earthquakes, United States), Epicenter, Position finding, Seismic waves, Propagation, Structural geology

Principle research activities during the period of December 15, 1964 to December 15, 1965 were concerned with (1) local epicenter location, (2) long range refraction, (3) computation of crustal models from gravity data and surface wave dispersion, and (4) computation of P-Residuals. Several epicenters were located in the Southern Applachians using data from Vela standard and mobile stations. P-Residuals have been computed for about 500 earthquakes recorded at Chapel Hil, North Carolina and the Cumberland Plateau Seismological Observatory. A systematic sinusoidal deviation of the residuals with epicentral distance has been observed. Magnitude, focal depth, and energy release for several earthquakes previously reported have been calculated. Estimates of crustal thickness in the Southeastern United States from gravity data using the basic sin x/x method have been made. A derivation of the sin x/x method using the concept of sampling by an infinite Dirac comb is developed. Results of refraction work in North Carolina using local quarry blasts is presented. Some preliminary results of participation in the East Coast On-Shore OffShore Experiment are also given. Several computer programs were developed during the course of study. These include epicehter location, P-Residual computation, mass anomaly computation from gravity anomalies, autoregression of time-series data, and the computation of phase velocities by bandpass filtering. (Author)

AD-625 971 Fld. 8/11
INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS UNIV OF CALIFORNIA SAN DIEGO
INVESTIGATION OF MICROSEISM SOURCES WITH OCEAN-BOTTOM SEISMOMETERS,
by H. Bradner, J. G. Dodds, and R. E. Foulks. 22 Jan 65, 16p. Contract AF49 (638)-1388
Unclassified report

Availability: Published in Geophysics v30 n4 p511-26 Aug 1965. Copies to DDC users only.

Descriptors: (*Microseisms, Pacific Ocean), (*Seismometers, Ocean bottom), Marine geophysics, Seismology, Seismic waves

Recordings to depths of 5 km have been made on the Pacific Ocean bottom with self-rising internally recording seismometers. Simultaneous recordings have been made at land stations. The ocean-bottom noise spectrum is between one and five orders of magnitude higher power than the land spectrum in the region from 0.1 to 9.0 cps. Coherence between two simultaneous instruments separated one-quarter kilometer is above the 95 percent confidence level from 0.1 cps to 0.6 cps. Attempts to associate narrow-beam Love and Rayleigh peaks with large storm-generating areas or with heavy swell striking shore have not produced consistent results. Although some records show the bulk of the microseism peak energy in well-defined modes, the energy is carried in different modes at different times and locations. Some of our data fit a model of microseism generation in a 100-mile strip, by a statistical superposition of incident waves and waves reflected from shore; and the subsequent conversion of the energy to Rayleigh aand Love modes propagating away from the generation zone. However, the shapes of the mid-ocean spectra strongly imply additional sources far from shorelines or recognized storms, unless microseisms attenuate far less in the ocean than on land. (Author)

AD-626 180 Fld. 8/11
CFSTI Prices: HC $2.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
ASYMPTOTICALLY OPTIMUM MULTIDIMENSIONAL FILTERING FOR SAMPLED-DATA PROCESSING OF SEISMIC ARRAYS.
Technical note,
by J. Capon, and R. J. Greenfield. 17 Dec 65, 44p. Rept. no. TN-1965-57
Contract AF19 (628)-5167 ,ARPA Order 512
ESD TDR-65-586
Unclassified report

See also AD-435 489.

Descriptors: (*Seismology, Data), (*Seismometers, Filters (Electromagnetic wave)), Noise, Statistical analysis, Stochastic processes, Synthesis, Seismic waves

A number of asymptotically optimum multidimensional filtering methods are investigated with the purpose of determining filtering techniques which require relatively little computing time to implement with a digital computer. In particular, the asymptotic properties of the maximum-likelihood and minimum-variance unbiased multidimensional filters are investigated in the sampleddata case. These two multidimensional filters are shown to be identical since they are both based on a conditional expectation. In addition, the martingale property of conditional expectation assures that the asymptotic properties of these multidimensional filters are well defined. An asymptotically optimum frequency domain synthesis procedure is given for two-sided multidimensional filters. This procedure is well suited to machine computation and has the advantage with respect to the exact recursive synthesis method of requiring much less computation time. A synthesis procedure for physically realizable multidimensional filters is presented which is based on a factorization of rational spectral matrices. This method is not, however, well suited to machine computation. An interpretation of optimum multidimensional filtering in terms of a frequency wavenumber space is also given. (Author)

AD-626 238 Fld. 8/11
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
RADIATION PATTERN OF MANTLE RAYLEIGH WAVES AND THE SOURCE MECHANISM OF THE HINDU KUSH EARTHQUAKE OF JULY 6, 1962,
by Ramesh Chander, and James N. Brune. 2 Mar 65, 20p. Rept. no. Scientific-3 ,LGO-845
Contract AF19 (628)-4082 ,AF19 (604)-7376
Proj. AF-8652, ARPA-2810 Task 865201, 28102
AFCRL 65-870
Unclassified report

Prepared in cooperation with Coast and Geodetic Survey, Washington, D. C.

Availability: Published in Bulletin of the Seismological Society of America v55 n5 p805-19 Oct 1965. Copies to DDC users only.

Descriptors: (*Earthquakes, Sources), (*Seismic waves, Propagation), Seismology, Epicenter, Afghanistan

The source mechanism of the Hindu Kush earthquake of July 6, 1962 (magnitude 6-3/4-7, focal depth 218 km) was studied by comparing the observed amplitude and phase radiation patterns of mantle Rayleigh waves of 150 sec and 200 sec period with theoretical radiation patterns of Rayleigh waves from single and double-couple point sources, and by considering evidence from Love waves and the shape of P and S pulses. The solution for the source mechanism, which is consistent with all the body wave and surface wave data available for this earthquake, is a double couple acting as a step function in time, with nodal planes oriented as determined from P wave data. Since for waves with periods greater than about 5 sec, the source appears to be an ideal point source, the radius of the equivalent source volume is estimated to be less than 10 km. For Rayleigh waves of 150 sec period, the agreement between observed and theoretical phases (for the above source model) is greatly improved by assuming regional phase velocities instead of a uniform phase velocity for all areas. It is concluded that with the accuracy currently attainable, a study of Rayleigh waves alone cannot determine the source mechanism of an earthquake uniquely. (Author)

AD-626 242 Fld. 8/11
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
MECHANISM OF DEEP EARTHQUAKES FROM SPECTRUMS OF ISOLATED BODY-WAVE SIGNALS. 1. THE BANDA SEA EARTHQUAKE OF MARCH 21, 1964.
Revised ed.,
by Ta-Liang Teng, and Ari Ben-Menahem. 8 Jul 65, 14p. Contract AF49 (638)-1337
Unclassified report

Revision of manuscript submitted 3 Jun 65.

Availability: Published in Journal of Geophysical Research, v70 n20 p5157-70 15 Oct 1965. Copies to DDC users only.

Descriptors: (*Seismology, Pacific Ocean), (*Earthquakes, Pacific Ocean), Epicenter, Seismic waves, Propagation

AD-626 404 Fld. 8/11, 14/2
CFSTI Prices: HC $3.00 MF $0.75
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
PRELIMINARY EVALUATION OF A CALIBRATION TECHNIQUE FOR MULTIPLE-ELEMENT ARRAY SYSTEMS.
Technical rept.,
by Y. T. Huang. 14 Sep 65, 89p. Rept. no. TR-65-111
Contract AF33 (657)-12145 Proj. AFTAC-VT/4051
Unclassified report

Supported in part by ARPA.

Descriptors: (*Seismographs, Calibration), Seismological stations, Seismometers, Seismic waves, Spectrum analyzers, Analog systems, Seismology

A concept is investigated for the calibration of seismographs which uses spectra of strong teleseismic P waves. This technique has a special application in Large Aperture Seismic Arrays (LASA), where calibration of each instrument individually becomes difficult because of the number of seismometers involved. Signals recorded by standard Benioff short-period seismographs were analyzed by means of an analog spectrum analyzer. The study shows a remarkable agreement between the estimated values of the relative magnification curves and the actually calibrated values for periods greater than 1 sec. For shorter periods, however, the agreement is not good enough for actual application. (Author)

AD-626 406 Fld. 8/11
CFSTI Prices: HC $3.00 MF $0.75
GEOTECHNICAL CORP GARLAND TEX
INSTALLATION OF A 10-ELEMENT SHALLOWBURIED ARRAY AT THE UINTA BASIN SEISMOLOGICAL OBSERVATORY, VERNAL, UTAH.
Technical rept.
5 May 65, 90p. Rept. no. TR-65-28
Contract AF33 (657)-12373 ,ARPA Order-104-60 Proj. AFTAC-VT/1124
Unclassified report

Descriptors: (*Seismometers, Underground structures), (*Seismological stations, Utah), Seismographs, Installation, Underground, Well logging, Geology, Seismology

Previous studies indicated that the effect of windgenerated noise on an array of seismometers is significantly reduced if the individual elements of the array are buried to a depth of approximately 200 feet. This report outlines, in some detail, the installation of a buried array at the Uinta Basin Seismological Observatory. Major considerations in such an undertaking included the selection of the most effective array pattern and the most suitable instrumentation to be used. In addition, the drilling, logging, and casing of the holes is outlined, and a brief section on the local geology is included. This report does not attempt to evaluate the effectiveness of the shallow-buried array, but merely documents the procedures and considerations utilized in the installation of a shallow-buried array. (Author)

AD-626 407 Fld. 8/11
CFSTI Prices: HC $3.00 MF $0.75
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
ARRAY RESEARCH. THEORETICAL CAPABILITY OF SYSTEMS OF HORIZONTAL SEISMOMETERS FOR PREDICTING A VERTICAL COMPONENT IN AMBIENT TRAPPED-MODE NOISE.
Special rept.,
by Thomas F. Potter, and Robert B. Roden. 9 Nov 65, 79p. Rept. no. SR-7
Contract AF33 (657)-12747 ,ARPA Order-104-60
Unclassified report

Descriptors: (*Seismometers, Site selection), Information theory, Signal-to-noise ratio, Seismic waves, Wave functions, Seismology, Seismographs, Configuration

From the results of the theoretical investigations reported in this report, it is concluded that multicomponent seismometer arrays offer a great deal of promise for signal enhancement applications. It is recommended that experimental investigations of such systems be undertaken as soon as possible.

AD-626 424 Fld. 8/11, 17/10
CFSTI Prices: HC $1.00 MF $0.50
TELEDYNE INDUSTRIES INC BILLINGS MONT EARTH SCIENCES DIV
LASA, OPERATIONS AND MAINTENANCE.

Quarterly progress rept. no. 2, 1 Sep-30 Nov 65. 10 Dec 65, 24p. Rept. no. 616-1265-2065
Contract AF33 (657)-14104 ,ARPA Order-599
Proj. AFTAC-VELA T/5071/ASD (32)
Unclassified report

Descriptors: (*Seismology, Instrumentation), Data processing systems, Seismographs, Seismological stations, Operation, Maintenance

The major areas of effort during this period were: (1) routine maintenance of the signal acquisition system: (2) initiation of analog recording and visual analysis at the Large Aperture Seismic Arrays (LASA) Data Center; and (3) engineering work on the standby power system.

AD-626 488 Fld. 8/11
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
SOURCE-MECHANISM FROM SPECTRA OF LONGPERIOD SEISMIC SURFACE WAVES. 3. THE ALASKA EARTHQUAKE OF JULY 10, 1958,
by Ari Ben-Menahem, and M. Nafi Toksoz. 31 May 63, 15p. Contract AF-AFOSR-25-63
AFOSR 5359
Unclassified report

Availability: Published in Bulletin of the Seismological Society of America v53 n5 p905-919 Oct 1963. Copies to DDC users only.

Descriptors: (*Earthquakes, Alaska), (*Seismology, Epicenter), Seismic waves, Data processing systems

Source-mechanism is derived from amplitude and phase spectra of mantle Love and Rayleigh waves of the Alaska earthquake of July 10, 1958. An agreement between theory and observations is obtained for a unilateral fault of 300-350 km, which ruptured with a speed of 3-3.5 km/sec in the direction N40 degree W. Fault length is in good agreement with the extent of aftershock distribution in the month of July, 1958, and the time of rupture checks with the duration of an impressive T-phase recorded at Hawaii. The phases of the signals are corrected for propagation, instrumental shift and the source finiteness. Initial phases thus obtained agree on a mechanism of a right double-couple with a unit step-function in time. (Author)

AD-626 528 Fld. 8/11, 14/2
CFSTI Prices: HC $3.00 MF $0.75
GEOTECHNICAL CORP GARLAND TEX
GALVANOMETERS, PROJECT VT/072.
Technical rept.,
by B. M. Kirkpatrick, and John Masse. 17 Dec 64, 59p. Rept. no. TR-64-133
Contract AF33 (657)-9967 ,ARPA Order-104-60 Proj. AFTAC-VT/072
Unclassified report

Descriptors: (*Galvanometers, Seismology), Design, Instrumentation, Coils, Magnets, Optical equipment, Magnetic properties, Sensitivity, Damping

Air damping in long-period galvanometers was reduced by a moving-magnet fixed-coil design, wherein the moving magnet is operated in an evacuated glass housing. The susceptibility of this arrangement to influence by local magnetic fields was minimized by use of a rotor assembly employing a multiplicity of magnetic poles evenly distributed around two ring magnets. Magnetic polarization of materials in the immediate vicinity of the ring magnets was controlled by continuous high-frequency degaussing. Testing of the moving-magnet galvanometer was not fully completed. Preliminary tests indicate that the influence of local magnetic fields has not been entirely eliminated. There appears to be no advantage to the moving-magnet galvanometer over the usual moving-coil design at free periods up to 100 sec. However, the moving-magnet galvanometer shows promise at periods in excess of 100 sec where the air damping in normal moving-coil designs becomes excessive. For dependable use, the galvanometer needs to be properly oriented in the local magnetic field. A computing or dynamometer-type galvanometer has been constructed and tested for use in seismic data analysis where a power-level indication is of interest and in signal multiplication and correlation.

AD-626 529 Fld. 8/11
CFSTI Prices: HC $3.00 MF $0.75
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
COMPARISON OF SEISMOGRAPH SYSTEMS AT UBSO.
Technical rept.,
by Frank F. Seymour. 3 Nov 65, 83p. Rept. no. TR-65-124
Contract AF33 (657)-12373 ,ARPA Order-624
Proj. AFTAC-VT/5054
Unclassified report

Descriptors: (*Seismological stations, Utah), Seismographs, Sensitivity, Seismic waves, Microseisms, Signal-to-noise ratio, Seismology

Five seismograph systems that are routinely operated at the Uinta Basin Seismological Observatory were evaluated to determine their relative capabilities in detecting teleseismic P-wave arrivals. This evaluation includes a detailed analysis of microseismic background noise, signal characteristics, and signal-to-noise ratios, as recorded on a single element of the surface array of seismographs, both the filtered and unfiltered summation of the outputs of the elements of the surface array, the shallow-hole, and the deep-hole seismograph systems. In addition, system magnitude residuals relative to magnitudes reported by the USC and GS as well as apparent arrival time residuals are presented. (Author)

AD-626 020 **See Fld. 8/4**

AD-626 380 **See Fld. 17/10**

AD-626 382 **See Fld. 17/10**

AD-626 403 **See Fld. 14/2**

AD-626 405 **See Fld. 17/10**

AD-626 408 **See Fld. 17/10**

8/12. SNOW, ICE, AND PERMAFROST

AD-625 745 Fld. 8/12
CFSTI Prices: HC $1.00 MF $0.50
COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H RESEARCH DIV
QUARTERLY PROGRESS REPORT, AUGUST-OCTOBER 1965.
Oct 65, 6p.
Unclassified report

Descriptors: (*Polar regions, Scientific research), Snow, Ice, Permafrost, Climatology, Meterology, Geology, Army research

The mission of the Research Division is to conduct basic research on the physical and mechanical properties of snow, ice, and frozen ground and their interrelationship with climatic and meteorological phenomena in order to support and improve the United States' military capability in cold regions.

AD-626 445 Fld. 8/12
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
DETERMINING THE THICKNESS OF MOUNTAIN GLACIERS BY THE 'BALANCES METHOD',
by N. N. Palgov. Jun 65, 8p. Rept. no. T-427-R
TT 66-60242,NCH ,NCH 202 452 CANCELED
Unclassified report

Trans. of Vsesoyuznee Geograficheskee Obshchestve. Izvestiya (USSR) v90 p170-6 1958. Also available from NRC as C-5467.

Descriptors: (*Glaciers, Measurement), Ice, Thickness, Determination, USSR

The balances method depends on the following data: in the highest degree on the precision of the data employed: on the following data: the ablation data, the surface levels survey, the morphometry of the glacier, and the speed of its movement.

AD-626 446 Fld. 8/12
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
THE FORMATION OF SHOALED-ICE MOUNDS (SAUCER-MOUNDS) AND FENCES,
by N. V. Glukhova. Sep 65, 6p. Rept. no. T-440-R
TT 66-60243
Unclassified report

Trans. of Arkticheskii i Antarkticheskii Nauchnoissledovatelskii Institut. Trudy (USSR) v267 p150-1 1964.

Descriptors: (*Ice islands, Physical properties), Ice, Ocean currents, Transport properties, USSR

AD-626 585 Fld. 8/12
CFSTI Prices: HC $3.00 MF $0.75
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
ICE ENGINEERING, TENSILE AND BENDING PROPERTIES OF SEA ICE GROWN IN A CONFINED SYSTEM.
Technical rept., Jun 64-Mar 65,
by J. E. Dykins. Jan 66, 75p. Rept. no. TR-R-415
Proj. Y-F015-11-01-052
Unclassified report

Descriptors: (*Ice, Mechanical properties), Sea water, Ice islands, Tensile properties, Creep, Deformation, Crystal structure, Civil engineering

The salinity, density, and petrographic structure of sea ice grown in a confined system can be closely identified with the characteristics of sea ice formed in a natural environment. This observation was made for ice 44 centimeters thick. The tensile strength was found to be more dependent on the orientation of the grain and subgrain structure than it was on temperature. The ice had a mean horizontal tensile strength of 67 psi at both -10C and -20C and of 78 psi at -27C. The mean vertical tensile strength was 152 psi at -10C, 163 psi at -20C, and 208 psi at -27C. The grain size or density of the ice did not have any appreciable effect on the tensile strength. The bending creep from single-point loading of simple ice beams was similar to the high-temperature creep behavior of other solid materials; i.e., the creep generally progressed through three stages: primary, secondary, and tertiary or the creep-rupture phase. (Author)

AD-626 043 **See Fld. 20/12**

AD-626 174 **See Fld. 8/13**

AD-626 175 **See Fld. 8/13**

8/13. SOIL MECHANICS

AD-625 737 Fld. 8/13
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
MEASURING SOIL PROPERTIES IN VEHICLE MOBILITY RESEARCH; AN EVALUATION OF THE RECTANGULAR HYPERBOLA FOR DESCRIBING THE LOADDEFORMATION RESPONSE OF SOILS.
Rept. no. 2,
by Newell R. Murphy. Oct 65, 63p. Rept. no. TR-3-652
Proj. DA-1-V-0-21701-A-046 Task 1V021701A04603

Unclassified report

Availability: U. S. Army Engineer Waterways Exp. Sta., Vicksburg, Miss. HC $0.75, CFSTI MF $0.75.

Descriptors: (*Soil mechanics, Trafficability), Soils, Compressive properties, Loading (Mechanics), Vehicles, Mobility, Mathematical analysis, Civil engineering

A proposed technique for describing the stress-strain relations from triaxial tests and pressure-sinkage relations from plate-penetration tests on sand and clay specimens prepared in the laboratory was studied. This technique, which is based on the characteristics of a rectangular hyperbola, was found to portray adequately the stress-strain relations examined. The pressure-sinkage relations usually require one hyperbola to describe the relation at shallow sinkages and another for greater sinkages. Certain of the hyperbolic parameters were found to be related to the physical characteristics of the soil test specimens. It is recommended that the study be extended to a wider range of soils and test conditions. (Author)

AD-625 871 Fld. 8/13
MASSACHUSETTS INST OF TECH CAMBRIDGE SOIL MECHANICS DIV
THE EFFECTS OF SALT ON THE CONSOLIDATION BEHAVIOR OF SATURATED REMOLDED CLAYS.
Phase rept. no. 3 on Research in Earth Physics,
by William A. Bailey. Oct 65, 171p. Rept. no. RR-R65-09
Contract DA-22-079-eng-330 Proj. 1-V-0-14501-B-52A-01
AEWES 3-101

Unclassified report

Availability: U. S. Army Engineer Waterways Exp. Sta., Vicksburg, Miss. HC $2.00, CFSTI MF $1.00.

Descriptors: (*Clay, Soil mechanics), (*Soil mechanics, Clay), Clay minerals, Salts, Compressive properties, Civil engineering

This report is a review of data obtained in the past ten years which illustrate the effects of salt on the consolidation and swelling behavior of remolded, saturated clays. This review was undertaken with two goals in mind: (1) to illustrate the influence salt has in the determination of the engineering parameters compression index and swelling index; and (2) to quantify, if possible, the significance of the contribution to effective stress of any long-range interaction between clay particles, a noncontact stress, during the consolidation and swelling process of clays.

AD-625 942 Fld. 8/13, 13/2
CFSTI Prices: HC $7.00 MF $1.50
MASSACHUSETTS INST OF TECH CAMBRIDGE SOIL MECHANICS DIV
SHEAR STRENGTH GENERATION IN STABILIZED SOILS.
Phase rept. no. 5,
by Anwar E. Z. Wissa, and Charles C. Ladd. Jun 65, 319p. Rept. no. RR-R65-17 ,Pub-173
Contract DA-22-079-eng-288 Proj. DA-1-V-0-21701-A-046-05,DA-1-V-0-14501-B-52-A-30

Unclassified report

Descriptors: (*Civil engineering, Soil mechanics), (*Soil mechanics, Bonding), (*Bonding, Soil mechanics), Stabilization systems, Soils, Adhesion, Cements, Shear stresses, Trafficability

The objective of this study was to determine the influence of cementation on the stress-strain and strength behavior of soils and to develop a mechanistic picture which would help predict field performance.

AD-626 174 Fld. 8/13, 8/12
CFSTI Prices: HC $2.00 MF $0.50
COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H
PRINCIPLES OF FROST HEAVING.
Research rept.,
by Shunsuke Takagi. Sep 65, 31p. Rept. no. RR-140
Task 1V014501B52A31

Unclassified report

Descriptors: (*Freezing, Soil mechanics), (*Soil mechanics, Freezing), Soils, Ice, Water, Thermodynamics, Models (Simulations)

Two formulations of soil freezing are presented, using a simple frost heaving model. Equations are given for freezing by segregation. A model is suggested to understand the properties of the segregating water layer in freezing by segregation, and adsorbed water around soil particles, the liquid-like layer on the ice surface, and various boundary liquids. The appendices present a literature review, an analysis of energy balance at the freezing by segregation, and technical notations. (Author)

AD-626 175 Fld. 8/13, 8/12
CFSTI Prices: HC $1.00 MF $0.50
COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H
FROST-HEAVING PRESSURES.
Research rept.,
by P. Hoekstra, E. Chamberlain, and A. Frate. Oct 65, 19p. Rept. no. RR-176
Task 1V014501B52A31

Unclassified report

See also AD-626 174.

Descriptors: (*Freezing, Soil mechanics), (*Soil mechanics, Freezing), Deformation, Pressure, Soils, Ice, Water, Thermodynamics, Porous materials, Models (Simulations)

Upon freezing a saturated soil in an open system from the top down, a considerable pressure develops. The pressure is the result of the surface energy of a curved ice-water interface. The curvature of the interface is necessary for ice to proliferate through the soil pores. The curvature is related to the pore size distribution of the soil. The test chamber is designed to minimize the friction of the soil with the wall. An accurate control of heat removal is obtained by thermoelectric cooling. A load cell placed on top of the sample is used to measure the pressure developed and at the same time prevents heaving of the sample. By measuring the pressure on a layered sample, it can be shown that the pressure develops at the freezing front. The results on several soils indicate that the maximum pressure that develops has a characteristic value for each soil. For each soil used, the water content versus tension curve is given and the maximum pressure is related to this curve. (Author)

AD-626 378 Fld. 8/13, 13/13, 13/2
CFSTI Prices: HC $4.00 MF $0.75
IIT RESEARCH INST CHICAGO ILL
BEHAVIOR OF ROCKS AND SOILS UNDER HIGH PRESSURE.
Final rept. 1 Jun 64-1 Aug 65,
by B. W. Paulding, R. H. Cornish, B. W. Abbott, and L. A. Finlayson. Dec 65, 104p. Contract AF29 (601)-6411 Proj. AF-5710 ,IITRI-M6083
Task 13.144
AFWL TR-65-51

Unclassified report

Descriptors: (*Civil engineering, Soil mechanics), (*Soil mechanics, High-pressure research), (*Engineering geology, High-pressure research), Loading (Mechanics), Soils, Rock (Geology), Mechanical properties, Test methods, Test equipment

This report describes a program which was directed toward developing a capability suitable for generating engineering data on the high pressure mechanical properties of geologic materials. To provide the greatest possible contribution, this effort concentrated on three of the most important deficiencies in high pressure experimental technology: (1) development of a system capable of accepting relatively large samples so that more-nearly representative data may be obtained than with the smaller samples used previously, (2) development of a system suitable for monitoring the strains of highly deformable geologic materials, and (3) development of an encapsulating technique for soils. Each of these objectives was attained to a certain degree. Specimens up to three inches in diameter were subjected to fluid pressures of several kilobars. The deformation of soil was measured with a potentiometric slidewire device. An encapsulating technique was developed for soils which was suitable up to about two kilobars. Further refinements are necessary, but it appears that the more important of the limitations of past studies have been overcome. (Author)

AD-625 732 **See Fld. 13/13**

8/14. TERRESTRIAL MAGNETISM

AD-625 883 Fld. 8/14
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
THE EARTH'S MAGNETIC FIELD,
by N. E. Malinina. Nov 65, 24p. Rept. no. TC-953
TT 66-60166

Unclassified report

Trans. of mono. Magnitnoe Pole Zemli, Moscow 1959 p8-16, 19-29.

Descriptors: (*Terrestrial magnetism, Mapping), Geodesics, USSR

AD-626 039 Fld. 8/14, 4/1
PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)
GEOMAGNETIC MICROPULSATIONS IN THE AURORAL ZONES,
by C. S. Wright, and J. E. Lokken. 4 Dec 64, 16p.
Proj. DRB-D45-95-11-39

Unclassified report

Availability: Published in Canadian Journal of Physics v43 p1373-87 Jul 1965. Copies to DDC users only.

Descriptors: (*Terrestrial magnetism, Polar region), Auroral, Magnetic storms, Ionospheric disturbances

AD-625 814 **See Fld. 4/1**

AD-626 071 **See Fld. 4/1**

AD-626 167 **See Fld. 4/1**

9/1. COMPONENTS

AD-625 669 Fld. 9/1
CFSTI Prices: HC $2.00 MF $0.50
CTS KNIGHTS INC SANDWICH ILL
HIGH PRECISION 5MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20C AND 30C.

Rept. no. 9, 10 Jun-10 Sep 65.
10 Sep 65, 42p. Contract NObsr-89290 Proj. SS-294001 Task 9215

Unclassified report

See also AD-619 735.

Descriptors: (*Quartz resonators, Temperature control), (*Temperature control, Quartz resonators), High frequency, Aging (Materials), Gain, Temperature, Performance (Engineering), Stability

The aging rates of 5 mc, fifth overtone 'room temperature' units for the last two of approximately four and one half months, confirm the conclusion that a very significant gain has been achieved by designing units for operation near the inflection temperature. The effect upon frequency and upon the slope of the aging curve of interruptions of oscillation and temperature control are shown both for units with very low rates of aging and for units with relatively high aging rates. (Author)

AD-625 676 Fld. 9/1, 20/6
CFSTI Prices: HC $2.00 MF $0.50
HP ASSOCIATES PALO ALTO CALIF
SEMICONDUCTOR MATERIALS.
Interim engineering rept. no. 6, 15 Jul-15 Oct 65. 15 Oct 65, 46p. Contract NObsr-89489 Proj. SR-008-0301 Task 9475

Unclassified report

See also AD-620 267.

Descriptors: (*Semiconductors, Electroluminescence), (*Electroluminescence, Display systems), (*Display systems, Diodes (Semiconductor)), Gallium alloys, Arsenic alloys, Phosphous alloys, Optical properties, Processing, Zinc, Diffusion, Luminescence, Emissivity, Etching

GaAs1-xPx from a commercial source and from an in-house materials development project has been thoroughly evaluated for use in injection electroluminescence display. The work includes measurement of optical transmission, etch pit density and photoluminescence in the starting material. Processing techniques for etch polishing, Zn diffusion and diode fabrication were developed and photoluminescence of the resulting p-skins and the spectra, luminous emittance and quantum efficiency in diodes were measured. The overall conclusion is that at present only the -hpamaterial is suitable for the display application. It yields smooth regular Zn diffusion fronts; the diodes have edge emission quantum efficiencies greater than .0001 and luminous emittances of roughly 50 lumens/sq ft at about 10 A/sq cm. (Author)

AD-625 708 Fld. 9/1, 20/10
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
WAVE-MECHANICAL APPROACH TO THE NONLINEAR THEORY OF O-TYPE TRAVELLING-WAVE TUBES,
by K. Mouthaan. 20 Jan 65, 11p. Contract DA-36-039-AMC-02164 (E) Grant AF-AFOSR-139-64
AFOSR 65-2447

Unclassified report

Availability: Published in International Journal of Electronics v18 n4 p301-11 Apr 1965. Copies to DDC users only.

Descriptors: (*Traveling-wave tubes, Quantum mechanics), Amplifiers, Performance (Engineering), Electrons, Equations of motion, Energy, Velocity

The one-dimensional motion of electrons in O-type travelling-wave devices is described in terms of wave mechanics. For the case of large-signal interaction it is found that in the final stage of the interaction the electrons travel along at discrete energy levels involving Planck's constant. By making use of the Pauli exclusion principle, the saturation power and electronic efficiency of the large-signal travelling-wave tube are obtained. (Author)

AD-625 733 Fld. 9/1, 9/3
CFSTI Prices: HC $1.00 MF $0.50
MITRE CORP BEDFORD MASS
A METHOD TO COMPUTE THE CHARACTERISTICS OF LUMPED ELECTROMAGNETIC DELAY LINES,
by H. B. Opladen. Dec 65, 23p. Rept. no. W-6324
Contract AF19 (628)-2390 Proj. AF-708
ESD TDR-64-628

Unclassified report

Descriptors: (*Delay lines, Electromagnetic properties), Frequency shift, Phase shift, Electrical engineering, Mathematical analysis

This document presents a method of computing the coefficients of the transfer function of iterated or noniterated lumped electromagnetic delay lines. The method shows that the coefficients can be found by using Pascal's triangle for iterated delay lines. (Author)

AD-625 740 Fld. 9/1
POLYTECHNIC INST OF BROOKLYN N Y
NETWORK THEORY OF SEMICONDUCTOR HALLPLATE CIRCUITS,
by J. M. Garg, and H. J. Carlin. 9 Mar 64, 15p.
Contract AF18 (603)-105
AFOSR 65-2271

Unclassified report

Availability: Published in IEEE Transactions on circuit Theory vCT-12 n1 p59-73 1 Mar 1965. Copies to DDC users only.

Descriptors: (*Networks, Semiconductor devices), (*Semiconductor devices, Hall effect), Voltage, Gain, Resistance (Electrical), Circuits, Waveguide circulators, Performance (Engineering)

Purely electrical realizations are discussed of the network element, the Gyrator, at low frequencies. The utilization of Hall effect in semiconductors and the properties of nonreciprocal devices based on this effect are discussed. A systematic study of the Hall plate, the best that can be expected from it and the conditions under which the best performance can be expected are established; and some new theoretical and practical schemes are suggested which permit better understanding of device performance and yield better devices. The Hall devices are nonreciprocal, passive, and stable but dissipative. They permit the extension of frequency range from dc to several magacycles over which the nonreciprocal devices can be used. In this sense they are complementary to the microwave Faraday-effect devices such as isolators and circulators and will permit greater flexibility and choice of elements for complex circuit designs, if the loss can be tolerated. Basic limitations are presented from an insertion loss standpoint, on the performance of Hall-plate circuits imbedded in resistance or reactance networks. (Author)

AD-625 755 Fld. 9/1, 13/8
CFSTI Prices: HC $3.00 MF $0.75
SYLVANIA ELECTRIC PRODUCTS INC WOBURN MASS SEMICONDUCTOR DIV
PRODUCTION ENGINEERING MEASURE FOR SILICON MIXER DIODE.
Quarterly progress rept. no. 2, 1 Jul-30 Sep 65, by G. Bowne, R. Bayliss, and C. Brunquell. 30 Sep 65, 60p. Contract DA-36-039-AMC-06159 (E)

Unclassified report

See also AD-619 664.

Descriptors: (*Crystal mixers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Crystal mixers), Mixers (Electronic), Silicon, Reliability (Electronics), Processing, Performance (Engineering), Life expectancy, Tests, Manufacturing methods, Thermal properties, Electrical properties, Packaging, Mechanical drawings, Hermetic seals, Beryllium compounds, Oxides.

The Second Engineering Test Sample Run has been completed using the new package design based on a beryllium oxide body with brazed metal end pieces. Test data show the design to be satisfactory from an electrical characteristic viewpoint. Analysis of Group B test data on units from the First Engineering Test Sample Run show environmental test results reasonably close to the objective AQL levels except for Moisture Resistance. Step stress analysis of storage life test data on units from the first run show a failure rate of 0.1% per 1000 hours compared to the objective 0.001%. (Author)

AD-625 756 Fld. 9/1, 13/8
CFSTI Prices: HC $3.00 MF $0.75
SYLVANIA ELECTRIC PRODUCTS INC WOBURN MASS SEMICONDUCTOR DIV
PRODUCTION ENGINEERING MEASURE (PEM) FOR SILICON VARACTOR DIODE.
Quarterly progress rept. no. 2, 1 Jul-30 Sep 65, by G. Bowne, and R. Bayliss. 30 Sep 65, 56p.
Contract DA-36-039-AMC-06159 (E)

Unclassified report

See also AD-619 663.

Descriptors: (*Varactor diodes, Manufacturing methods), (*Silicon, Varactor diodes), Diodes (Semiconductor), Reliability (Electronics), Processing, Performance (Engineering), Life expectancy, Tests, Thermal properties, Electrical properties, Packaging, Mechanical drawings

Group B test results have been completed on units from the First Engineering Test Sample Run. Process improvements evolved during the first and second quarters are described and have been incorporated in the Second Engineering Test Sample Run. The second run has been completed and devices are in the testing cycle. (Author)

AD-625 769 Fld. 9/1
CFSTI Prices: HC $5.00 MF $1.00
GENERAL ELECTRIC CO AUBURN N Y SEMICONDUCTOR PRODUCTS DEPT
THE DEVELOPMENT AND EVALUATION OF A BILATERAL TRIODE SWITCH.
Final rept. 13 Apr-64-13 Oct 65.
13 Apr 64, 187p. Contract NObsr-91151 Proj. SR-0080304 Task 9348

Unclassified report

Descriptors: (*Electronic switches, Semiconductor devices), (*Semiconductor devices, Electronic switches), Rectifiers, Gold, Doping, Gates (Circuits), Processing, Silicon, Triodes

This report describes the work performed toward the development of an improved bidirectional triode p-n-p-n switch. Qualitative and quantitative descriptions of the operation of the device are given. Calculations of the sheet conductivity of double-erfc-diffused layers and an extensive analysis of the effects of sheet resistance on the lateral current distribution in the two bases of p-n-p-n switch are presented. A model of the heat flow paths within the device is developed and its feasibility as well as its applicability to established computer-performed rating procedures is shown. The concept of commutating dv/dt is developed and its effect on the design of bidirectional triodes is considered. Device assembly techniques are discussed. Data concerning the effects of gold doping on the characteristics of the device, and a discussion of the characteristics of the device, and a discussion of the characteristics of the stateof-the-art samples shipped during the fourth quarter are also presented. The features of the final design are described, especially those bearing on the dynamic

properties of the device. Photoresist techniques as employed on this device are discussed. (Author)

AD-625 813 Fld. 9/1
CFSTI Prices: HC $3.00 MF $0.75
BATTELLE MEMORIAL INST COLUMBUS OHIO
MICROELECTRONIC STUDIES, ANALYSIS OF MOSFIELD-EFFECT TRANSISTORS.
Special rept.,
by R. B. Sorkin, J. L. Easterday, J. W. Klapheke, and A. B. Timberlake. 15 Apr 65, 72p. Rept. no. NADC-AE-6513
Task RAV03J004/2021/F021-01-01
Unclassified report

Descriptors: (*Transistors, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Transistors), State-of-the art reviews, Integrated circuits, Metals, Oxides, Semiconductors, Performance (Engineering)

The report presents the results of a limited study on the state of the art of MOS field-effect transistors. The study on the MOS field-effect transistors was undertaken to evaluate their potential for integrated circuit applications.

AD-625 831 Fld. 9/1, 13/8
CFSTI Prices: HC $4.00 MF $1.00
BLILEY ELECTRIC CO ERIE PA
PRODUCTION ENGINEERING MEASURE CR-(XM-45)/U CRYSTAL UNITS.
Final rept. May 62-Aug 65,
by J. M. Wolfskill, A. R. Krespan, and R. C. Mouck. Sep 65, 134p. Contract DA-36-039-SC-86719 (E)
Unclassified report

See also AD-613 188.

Descriptors: (*Quartz resonators, Manufacturing methods), Performance (Engineering), Low frequency, Vibration, Shock resistance, Processing, Mechanical drawings, Design, Packaging, Thermal properties, Electrical properties, Quality control

The report covers Step I of the PEM study. It outlines the original objectives; discusses the design problems; traces the progress of the development; presents the specification finally derived; gives details of the designs established; includes a process manual to describe manufacturing operations and a quality control system for controlling and monitoring production; finally, it lists production yields and summarizes performance-evaluation data from 300 pilot-run samples. The project was concluded satisfactorily: a cumulative yield of 58.5% was obtained during the pilot run. There were no significant differences between natural quartz units and cultured quartz units, either in yields or performances. Statistical evaluation indicated that at least 99% of the pilot-run units met all requirements; more than 90% had performance levels significantly better than required to satisfy the specification.

AD-625 890 Fld. 9/1, 13/8
CFSTI Prices: HC $2.00 MF $0.50
PIEZO CRYSTAL CO CARLISLE PA
QUARTZ CRYSTAL UNITS, FILTER LOW FREQUENCY, 1 MC TO 10 MC TYPES CR- (XM-49)/U THRU CR- (XM-52)/U.
Quarterly progress rept. no. 5, Jul-Sep 65,
by A. S. Matistic. 5 Nov 65, 29p. Contract DA-36-039-AMC-03635 (E)
Unclassified report

See also AD-622 206.

Descriptors: (*Crystal filters, Manufacturing methods), (*Quartz, Crystal filters), High frequency, Medium frequency, Crystal holders, Performance (Engineering)

The report period was concerned with technical problems which required solution before preproduction samples could be fabricated. Actions which were introduced to resolve these technical difficulties were: submission and approval of a TAR to modify certain SCS-191 requirements (to render the mass loading technique compatible with requirements), mass loading experiments at problem frequencies 5 mc and 16 mc, and fabrication of prototype HC-6/U mounts to accommodate 0.600 inch diameter crystal blanks. Remaining time in the period was expended on fabrication - to the mounting operation of preproduction samples at frequencies 1.75 mc and 10 mc. Although much technical progress has been made, additional design refinements are required at frequencies 5 mc and 6 mc before preproduction samples will be fabricated at these 2 frequencies. (Author)

AD-625 904 Fld. 9/1, 11/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
ELECTROMAGNETIC SHIELDING WITH COKE,
by P. F. Nicholson. 18 Jul 60, 17p. Rept. no. NRL-1080
Unclassified report

Descriptors: (*Electromagnetic shielding, Coal), (*Noise, Electromagnetic shielding), (*Coal, Electromagnetic shielding), Materials, Effectiveness, Concrete, Frequency

It was found that a reasonably good grade of high temperature coke satisfied the requirements of an excellent electromagnetic shield plus being both abundant near the locality of the NRRS site (West Virginia) and inexpensive.

AD-625 948 Fld. 9/1, 12/1
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y RESEARCH DEPT
COMPUTATIONAL TECHNIQUES FOR THE SYNTHESIS OF OPTIMUM NONUNIFORM TRANSMISSION LINES BASED ON VARIATIONAL PRINCIPLES,
by M. R. Wohlers, R. E. Kopp, and H. G. Moyer. 1965, 7p. Contract AF49 (638)-1512
AFOSR 65-2338
Unclassified report

Availability: Published in Proceedings of the National Electronics Conference, v21 p135-40 1965. Copies to DDC users only.

Descriptors: (*Transmission lines, Synthesis), (*Optimization, Transmission lines), Calculus of variations, Design, Networks, Broadband, Amplifiers, Masers

The application of variational techniques to the design of nonuniform distributed transmission lines is discussed. The variational techniques described were originally developed for aerospace guidance application and have been quite successful in overcoming this difficulty. They have been applied to the synthesis problem of distributed transmission lines in order to obtain solutions in a direct numerical manner, so that the over-all performance of the system will be an optimum in some prescribed sense. The advantages of this approach include the circumvention of the classic approximation-realization cycle of network theory, and the ability to impose implicit max-min constraints on the values of the line parameters.

AD-625 956 Fld. 9/1
CFSTI Prices: HC $3.00 MF $0.75
SYLVANIA ELECTRIC PRODUCTS INC WOBURN MASS SEMICONDUCTOR DIV
RELIABILITY ANALYSIS OF X-BAND TUNNEL DIODES.
Final technical rept.,
by Charles Davis, and Arthur Lueck. Dec 65, 74p. Contract AF30 (602)-3487 Proj. AF-4519
Task 451901
RADC TR-65-291
Unclassified report

See also AD-615 498.

Descriptors: (*Tunnel diodes, Reliability (Electronics)), X-band, Manufacturing methods, Processing, Semiconductor devices, Encapsulation, Germanium alloys, Tin alloys, Arsenic, Gallium

The report presents an account of a microwave tunnel diode improvement program, and the results obtained from reliability tests performed on devices fabricated by the improved processes. A new solid structure tunnel diode was developed during this contract which exhibits superior reliability characteristics to any previously tested tunnel diode. The process and fabrication details for this device along with reliability data are included in the report. (Author)

AD-625 972 Fld. 9/1
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB
THE SHORT-BACKFIRE ANTENNA,
by H. W. Ehrenspeck. 2 Jun 65, 11p. Rept. no. Instrumentation Papers-86
Proj. AF-5635 Task 563502
AFCRL 65-768
Unclassified report

Availability: Published in Proceedings of the IEEE v53 n8 p1138-40 Aug 1965. Copies to DDC users only.

Descriptors: (*Antennas, Gain), S band, Antenna radiation patterns, Antennas, Reflectors, Dipole antennas

A new type of antenna, the 'Short Backfire,' consists of two plane reflectors, spaced approximately half a wavelength apart, and the feed between them. It develops a high gain and its patterns have a very low sidelobe level. (Author)

AD-626 047 Fld. 9/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
A BAND HYBRID COUPLING,
by L. G. Maloratskii. Dec 65, 5p. Rept. no. FSTC-381-T65-592
TT 66-60176
Unclassified report

Trans. of Patent (USSR) 166 390, pub. in Byulleten Izobretenii i Tovarnykh Znakov (USSR) n22 p31-2 1964.

Descriptors: (*Coupling circuits, Power dividers), (*Power dividers, Coupling circuits), USSR, Patents, Capacitance

The subject of the invention is a band hybrid coupling on the basis of a multiloop directional coupler. To obtain great flexibility in the selection of operating parameters for the device, instead of connecting the central loop, a directional coupler with capacitance coupling is connected to it. (Author)

AD-626 067 Fld. 9/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
MEASUREMENT OF NANOSECOND WAVE LOSSES IN WAVEGUIDES,
by A. B. Dogadkin. Dec 65, 11p. Rept. no. fstc-381-T65-598
TT 66-60186
Unclassified report

Trans. of Elektrosvyaz (USSR) n11 p27-32 1964.

Descriptors: (*Waveguides, Radiofrequency power), (*Radiofrequency power, Attenuation), Measurement, Transmission lines, USSR

A pulse method is used to measure linear losses (pulse packet method) in short waveguide sections. The optimum theoretical conditions are given which provide the most exact measurements. It is shown experimentally that nanosecond radiowave losses can be measured in waveguides 5 to 10 m long. (Author)

AD-626 181 Fld. 9/1, 13/8
CFSTI Prices: HC $3.00 MF $0.75
REEVES-HOFFMAN DIV DYNAMICS CORP OF AMERICA CARLISLE PA
SINGLE SIDEBAND QUARTZ CRYSTAL UNITS FOR VHF APPLICATIONS (METAL ENCLOSURES).
Quarterly progress rept. no. 2, 1 Aug-30 Sep 65,
by George E. Ritter. 30 Oct 65, 74p. Contract DA-28-043-AMC-01325 (E) Proj. DA-1P6-22001-A-058 Task 1P6-22001-A-05801
Unclassified report

See also AD-623 716.

Descriptors: (*Quartz resonators, Very high frequency), Single sideband communication systems, Sidebands, Encapsulation, Brazing, Bonding, Seals, Hermetic seals, Glass, Reliability (Electronics), Electrodes, Gold, Nickel

The new coldweld enclosure with dimensions conforming with the HC-6/U is on order. The available transistor coldweld enclosure was accepted by the government representative at the last conference. Some brazing difficulties were experienced, however, the problems are being resolved. Most of the modifications needed for the thermocompression bonding apparatus are completed and preparations are being made to adapt a method to employ AT resonators in the holding fixture. The glass bonding technique has been centered around the sodium silicate as a bonding agent. A major problem developed when high temperature, vacuum tests were conducted on the bonding material; the gold plated electrodes lose adherence to the quartz at high temperatures. The vacuum bakeout chamber is being fabricated. The particular arrangement will allow the bakeout and sealing of the resonator units to take place in the same vacuum environment. The quartz resonator design is nearly completed and only some minor adjustments of electrode and ZZ' angle are needed. An aging facility was constructed and it is now being aged before employment. (Author)

AD-626 182 Fld. 9/1, 13/8
CFSTI Prices: HC $5.00 MF $1.00
WESTINGHOUSE ELECTRIC CORP PHILADELPHIA PA
PRODUCTION ENGINEERING MEASURE TYPE 2N2762 FAMILY SILICON ALLOY TRANSISTOR.
Final rept. 22 Jun 63-25 Nov 65,
by R. J. Pisarcik, J. Priest, and R. Harm. 25 Nov 65, 190p. Contract DA-36-039-AMC-03617 (E)
Unclassified report

See also AD-617 736.

Descriptors: (*Transistors, Manufacturing methods), Silicon, Reliability (Electronics), Processing, Quality control, Encapsulation, Soldering, Diffusion, Thickness, Molybdenum

Data are presented that illustrate an improvement in the secondary breakdown characteristics of the device due to the improved method of junction termination. Improved handling of base assembly and reduction in the thickness of the molybdenum mounting disc are two process improvements developed independently of the contract program but included as additional steps toward reliability improvement. Critical control of the starting material during Phase III of the production run illustrated a definite improvement in the distribution of higher voltage devices. The results presented for the high temperature step-stress test program illustrate an improvement in the reliability of devices fabricated using techniques refined during the course of the contract program when compared to those fabricated using standard procedures. (Author)

AD-626 195 Fld. 9/1, 20/14
CFSTI Prices: HC $4.00 MF $0.75
MICROWAVE ASSOCIATES INC BURLINGTON MASS
MILLIMETER-WAVE GENERATION TECHNIQUES.
Rept. for 1 Apr 64-1 May 65,
by T. B. Ramachandran, M. Gilden, and J. Pergola. Dec 65, 124p. Contract AF33 (657)-10925 Proj. AF-4460 Task 446001
AFAL TR-65-290
Unclassified report

See also AD-609 625.

Descriptors: (*Millimeter waves, Microwave oscillators), (*Microwave oscillators, Semiconductor devices), (*Semiconductor devices, Microwave oscillators), Radiofrequency generators, Photoelectric cells (Semiconductor), Gallium alloys, Arsenic alloys, Phosphides, Theory, Lasers, Semiconductors, Solid state physics

Research was performed on two programs; Task I, millimeter-wave generation using the electro-optical approach; Task II, microwave generation using bulk properties of gallium arsenide by direct conversion from d-c or pulsed sources. Using a PIN structure of the GaAs (x)P (1-x) - GaAs material system, a photodetector has been fabricated that is capable of detecting beat frequencies from a gallium arsenide laser of at least 40 Gc. This heterojunction structure has an 11% phosphide P+ layer for the light incident surface and is compatible with gallium arsenide light sources. Also presented is the investigation into the inefficiency of the 80% phosphide heterojunction structure. The generation of microwave energy (Task II) using bulk properties of gallium arsenide (currently called the 'Gunn effect') is discussed in terms of both large-and-small-signal theory. The large-signal theory involves the concept of moving domains resulting from an electric field controlled negative resistivity. The small-signal theory involves space-charge wave propagation which results in negative resistance effects at the sample terminals. Qualitatively, the effect of carrier transit-time, terminal condition and doping level are given. (Author)

AD-626 219 Fld. 9/1
CFSTI Prices: HC $1.00 MF $0.50
VARIAN ASSOCIATES PALO ALTO CALIF
STUDY OF A 100-WATT KU-BAND TRAVELING WAVE TUBE.
Quarterly rept. no. 1, 1 Jul-30 Sep 65,
by S. Paul Otsuka. Oct 65, 22p. Contract DA-28-043-AMC-01514 (E) Proj. DA-1E0-21101-A-218 Task 1EO-21101-A-218-01
ECOM 01514-1
Unclassified report

Descriptors: (*Traveling wave tubes, Manufacturing methods), Design, Broadband, Power amplifiers, Helixes, Electron guns, Waveguides, Focusing, Magnets, Processing, Electron tube parts, K band

The preliminary electrical design was completed except for the helix to waveguide transitions. The PPM focusing stack was designed, fabricated and measured. A beam tester was constructed, exhausted, cathodeprocessed and made ready for test. Studies of efficiency improvement were made using a velocity taper for the helix slow wave structure. (Author)

AD-626 296 Fld. 9/1
CFSTI Prices: HC $4.00 MF $0.75
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
STATISTICAL THEORY OF ELECTRON TRANSPORT IN CROSSED FIELDS: CHARACTERISTICS OF THE SMOOTH-BORE MAGNETRON.
Research rept.,
by K. Mouthaan. 6 Aug 65, 113p. Rept. no. ERL-65-29
Contract DA-36-039-AMC-02164 (E) Grant,AF-AFOSR-139-63 Proj. DA-3A99-13-001
Unclassified report

Descriptors: (*Statistical mechanics, Electrons), (*Magnetrons, Electron beams), (*Electron beams, Crossed field devices), (*Crossed field devices, Electron beams), Transport properties, Field theory, Electron transitions, Probability

Electron transport across the magnetic field in crossed electric and magnetic fields is described on the basis of random fluctuations in the flields. The theory is formulated in terms of the slipping-stream instability, so that a definite mechanism behind the fluctuations in the fields is established. The transport equation appropriate to the analysis is shown to be the diffusion equation; a definite expression for the diffusion tensor is obtained. The components of the diffusion tensor transverse to the magnetic field are found to be proportional to the square of the electric field, and inversely proportional to the cube of the magnetic field; the exponential-growth rate of the slipping-stream instability determines the magnitude of the diffusion coefficients. Application of the theory is made to find the cut-off characteristics of the smooth-bore magnetron. Explicit expressions for the space-charge distribution, the electric-field distribution, the anode current, and the circulating current are obtained. The results are compared with available experimental results. The agreement between theoretical and experimental values is good, particularly for the anode current. The new theory thus appears to provide, for the first time, a correct theoretical explanation of the cut-off characteristics of the smooth-bore magnetron. (Author)

AD-626 300 Fld. 9/1, 12/1
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
GENERATION OF TREES WITHOUT DUPLICATIONS.
Revised ed.,
by W. Mayeda, and S. Seshu. 26 Jan 64, 5p. Contract AF49 (638)-1383 Proj. AF-9749 Task 974901
AFOSR 65-1970
Unclassified report

Revision of manuscript submitted 4 Sep 64.

Availability: Published in IEEE Transactions on Circuit Theory vCT12 n2 p181-5 Jun 1965. Copies to DDC users only.

Descriptors: (*Electrical networks, Topology), Graphics, Functions, Programming (Computers)

Recent emphasis on the use of electronic digital computers has focused attention on a number of practical problems which were hitherto treated on an 'existence' basis. One problem which arises in computer analysis of electrical networks is the listing of all trees in the network. Any practically useful scheme must find all the trees of the network without generating duplicates (for practical networks the number of trees exceeds the fast memory of any computer and, hence, slows down search for duplicates). Also, the trees must be generated by replacement of one branch at a time in order to keep track of signs (for active network analysis). a practical procedure satisfying these conditions is presented in this paper. (Author)

AD-626 326 Fld. 9/1, 9/5
CFSTI Prices: HC $3.00 MF $0.75
HUGHES AIRCRAFT CO FULLERTON CALIF GROUND SYSTEMS GROUP
HIGH POWER MODULATOR SWITCH STUDY (TRANSISTOR).

Interim rept. for 4 Feb-10 Aug 65,
by J. V. Stover, J. A. Rogers, and G. Sloan. Dec 65, 62p. Rept. no. FR-65-14-188
Contract AF30 (602)-3654 Proj. AF-5573 Task 557303
RADC TR-65-372

Unclassified report

Descriptors: (*Modulators, Switching circuits), (*Transistors, Switching circuits), (*Electronic switches, Transistors), Feasibility studies, Performance (Engineering), Pulse modulation

The program is a study to determine the feasibility of using commercially available low cost transistors in high power pulse modulator service. Representative types and classes of transistors were selected for measurements at collector pulse current levels greater than the published D-C ratings. Circuit configurations were developed for test and evaluation of the selected transistors and the complementary pair switch element circuit best provides a test vehicle. (Author)

AD-626 328 Fld. 9/1, 20/3
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
GENERATION OF INTENSE MAGNETIC FIELDS,
by D. Bruce Montgomery. 1965, 11p. Contract AF49 (638)-1468 Proj. AF-9764 Task 976400
AFOSR 65-1980

Unclassified report

Availability: Published in Journal of Applied Physics v36 n3 pt 2 p893-800 Mar 1965. Copies to DDC users only.

Descriptors: (*Magnets, Design), Superconductors, Cryogenics, Solenoids, Magnetic fields

The advent of high-field superconducting magnets has made magnetic fields above 30 kG available to the entire scientific community. Small diameter coils to 60 kG cost considerably less than conventional 12-in. iron magnet systems. Fields to 80 kG, and in a few recent instances to 100 kG, even in multicentimeter bores, are now economically within the reach of most research budgets. The current and future status of superconducting magnets, their economic advantages and associated problems are presented. Other methods of generating fields, such as water-cooled continuous magnets, millisecond pulse magnets, and long-pulse cryogenic magnets, will find their principal use in reaching even higher fields, supplementing superconducting magnets, or in circumventing problems which preclude the use of superconductors. Pulse magnets are presented as a relatively simple and inexpensive method of producing millisecond fields up to 500 kG and long pulses to 250 kG. Relationships between energy, time, and volume are given for pulse magnets. The current and future status, and the problems associated with conventional continuous field magnets in the 100 to 250 kG range are given and the availability of such magnets at the National Magnet Laboratory discussed. New critical current-critical field data for niboium-tin materials measured in continuous fields up to 180 kG is presented. (Author)

AD-626 362 Fld. 9/1, 9/4
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
SOME USEFUL EXPRESSIONS FOR OPTIMUM LINEAR FILTERING IN WHITE NOISE: II,
by Donald L. Snyder. 29 Jun 65, 2p. Contract DA-36-039-AMC-03200 (E) Grant ,NSF-GP-2495

Unclassified report

See also AD-620 006.

Availability: Published in Proceedings of the IEEE, p1254-5 Sep 1965. Copies to DDC users only.

Descriptors: (*Filters (Electromagnetic wave), Optimization), Noise (Radio), Demodulation

AD-626 379 Fld. 9/1
CFSTI Prices: HC $2.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
MICROWAVE TRANSISTORS.
Quarterly rept. no. 1 1 Jun-31 Aug 65,
by George Johnson, Dave Boone, and Julius Lange. Oct 65, 40p. Rept. no. TI-03-65-106
Contract DA-28-043-AMC-01371 (E) Proj. DA-1P6-22001-A-056 Task 1P6-22001-A-056-04

Unclassified report

Descriptors: (*Transistors, Microwave equipment), Germanium, Doping, Diffusion, Manufacturing methods, S band, Oscillators, C band, Design, Wiring diagrams, Microminiaturization (Electronics)

A preliminary design study of a 3GHz and a 6 GHz lownoise transistor was made. The general approach to the development of these transistors is discussed along with calculatedo operating parameters and some of the developmental problems involved. P-type diffusion studies have been carried out under both vacuum and atmospheric pressures conditions in an attempt to obtain the desired base surface concentrations required for high frequency transistor development. It was found that surface concentrations from vacuum diffusions were not reproducible to a satisfactory degree, but those from open-tube diffusions show definite promise. Further refinements of the open-tube process are planned. Circuit development work centered around the design of an S-band voltage tunable oscillator. Prototype fixed frequency designs were fabricated and tested. The results indicate the method of design and circuit realization techniques were satisfactory. The design of a prototype voltage tunable S-band oscillator on ceramic has been completed. Calculations show the circuit will be able to be fabricated in a very small enclosure approximately 300 mils on a side. (Author)

AD-626 383 Fld. 9/8 13/8
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO PALO ALTO CALIF
LOW NOISE 26-40 GC TWT DEVELOPMENT.
Interim rept., 1 Jan-1 Jul 65,
by W. E. Raub. Dec 65, 28p. Rept. no. R65ELM262-1
Contract AF30 (602)-3617 Proj. AF-5573 Task 557301
RADC TR-65-333

Unclassified report

Descriptors: (*Traveling wave tubes, Manufacturing methods), (*Microwave amplifiers, Traveling wave tubes), Design, K band, Noise (Radio), Radiofrequency amplifiers, Specifications, Gain, Band width, Helixes, Electron guns, Cathodes (Electron tube), Jigs, Processing

The report covers the work of the first 6 months of a 15 month program for the development of Ka-band (26 to 40 Gc), low noise traveling wave tube amplifier. The initial tube design and construction techniques are reviewed under the headings helix, low noise gun, overall tube design, and mechanical design of tube, jigs, and fixtures. From study of the many factors involved, the initial helix design analysis was based on a gamma at 40 Gc of 2.9, a cathode to helix diameter of 0.5, and a beam of 400 a. Helix calculations at 2000 v, 2500 v, and 3000 v, indicated that a two section helix at approximately 2000 v input and 3000 v output is best for this Ka-band tube. The low noise gun considerations are based on the two important gun regions: the low noise diode region and the noise wave transformer region. Due to the small cathode diameter imposed by the high frequency, a cathode with side coating, which will increase the emitting area over that obtained with a parallel flow gun, is discussed. Mechanical design and assembly jig and fixture techniques, which are extremely important to the successful development of a Ka-band tube, were evaluated, and it was determined that the gun stack alignment to the helix ID and the cathode alignment to the gun stack are the most critical construction areas.

AD-626 417 Fld. 9/1, 16/4
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
MINIATURE AND SUBMINIATURE TUBE WARM-UP STUDIES,
by S. A. Buckingham, M. H. Stephan, and F. L. W. Moehle. Feb 56, 47p. Rept. no. APL/JHU-TG-245-6
Contract NOrd-7386

Unclassified report

Descriptors: (*Miniature electron tubes, Heating), (*Subminature electron tubes, Heating), Electron tube heaters, Performance (Engineering), Triodes, Pentodes, Diodes, Guided missile components

Increasing attention is being paid to the problem of rapid warm-up of the electronic hardware in guided missiles. At present, electron tube specifications afford no control on tube warm-up characteristics. Described in this paper, are the results of a series of experiments upon commonly used miniature and subminiature tubes, and some of the variables influencing warm-up time are separated and analyzed. A method of improving warm-up by short duration over-voltage pulsing of the heaters has been explored. Several approaches are suggested by which the missile design engineer may cope with a requirement for rapid warm-up. (Author)

AD-626 419 Fld. 9/1, 13/8
CFSTI Prices: HC $3.00 MF $0.50
GENERAL ELECTRIC CO AUBURN N Y SEMICONDUCTOR PRODUCTS DEPT
A PRODUCT ENGINEERING MEASURE FOR THE IMPROVEMENT OF PRODUCTION TECHNIQUES TO INCREASE THE RELIABILITY AND TO IMPROVE PRODUCT CAPABILITY OF HIGH VOLTAGE MINIATURE SILICON RECTIFIERS.
Quarterly progress rept. no. 3, 30 Jun-30 Sep 65,
by W. R. Comstock, N. E. Devolder, R. R. Schall, and E. G. Tefft. 30 Sep 65, 55p. Contract DA-36-039-AMC-06157 (E)

Unclassified report

See also AD-624 858.

Descriptors: (*Rectifiers, Manufacturing methods), (*Silicon, Rectifiers), (*Diodes (Semiconductor), Silicon), Reliability (Electronics), Specifications, Pellets, Glass, Casting, Encapsulation, Electrical properties, Failure (Electronics), Switching circuits

The work reported during the report period includes: (1) the adoption of a 'standard' pellet design to use as a control for additional experiments. (2) the evaluation of pellet design experiments performed during the second quarter. (3) the optimization of the glassing process to yield acceptable devices. (4) the replacement of the copper lead wire material with copper alloy lead wire to obtain reliable welding to the device slugs. (5) results from the A 13 matrix testing through the 1000-hour readout. (6) the presentation of the Eyring Model for expressing failure rates. (7) modification of the proposed device specification. (8) use of a new switching speed circuit to better define recovery time. (9) the delivery of the Third Engineering Samples.

AD-626 433 Fld. 9/1, 13/8
CFSTI Prices: HC $2.00 MF $0.50
BLILEY ELECTRIC CO ERIE PA
PRODUCTION ENGINEERING MEASURE. CR-(XM53/U QUARTZ CRYSTAL UNITS.
Quarterly rept. no. 3, May-Jul 65,
by J. M. Wolfskill, Merle George, and Robert

Mouck. Jul 65, 29p. Contract DA-36-039-AMC-03640 (E)

Unclassified report

See also AD-618 490.

Descriptors: (*Quartz resonators, Manufacturing methods), Crystal holders, Radiofrequency power, Performance (Engineering), Reliability (Electronics), Jigs, Test equipment, Processing

During the third period, the development of crystal unit designs was nearly completed. Designs for the crystal resonators themselves were established, and designs for the mounting assemblies were nearly completed. A special 'claw' mounting arrangement was developed; when adapted to the 1-megacycle units, it greatly improved Q levels, but it was not as adaptable to the higher frequencies because of their thinner quartz plates. As a result, it has been found impractical to meet the millionQ goal at frequencies above two megacycles with production-type units. Revised requirements of 0.9-million at 3 Mc, 0.8-million at 4 Mc, and 0.6-million at 5 Mc have been proposed. The equipment and procedures for conducting the 6-month reliability study have been established and are being checked out by use on experimental units. The arrangement provides practical means of making weekly frequency headings on 1000 units by using special holding jigs to position crystals in precision oilbath temperature controllers and using transistor oscillators which connect directly to terminals on the positioning jigs. Readings are recorded by a digital printer. (Author)

AD-626 437 Fld. 9/1, 13/8
CFSTI Prices: HC $3.00 MF $0.75
RADIO CORP OF AMERICA MOUNTAINTOP PA ELECTRONIC COMPONENTS AND DEVICES
PRODUCTION ENGINEERING MEASURE ON 2N3375 SILICON OVERLAY TRANSISTOR.
Quarterly progress rept. no. 3, 1 Jul-30 Sep 65,
by F. Tumbelty, and J. C. LaBerge. 30 Sep 65, 91p. Contract DA-36-039-AMC-03643 (E)
Proj. DA-47001

Unclassified report

Descriptors: (*Transistors, Manufacturing methods), Processing, Doping, Oxides, Epitaxial growth, Electric wire, Bonding, Ultrasonic radiation, Reliability (Electronics), Life expectancy, Silicon

The following observations were made from the results of work performed in device processing areas: (1) Tests made on devices that incorporated n-type diffusion demonstrated that POCl3 results in better control over impurity distribution. (2) The absence of metallization interface failures has confirmed that gold is the most suitable material for the mounting surface. (3) Evaluation of life test and yield improvement results have shown that it is adviseable to use a double evaporation system and increased thickness of the standard metal for contact metallization. (4) Ultrasonic lead bonding has been improved considerably. (5) Tightened endpoint criteria were necessary to establish an initial failure rate. A number of investigations were either continued or initiated during this quarter: the investigation of oxide growth and doping was continued; various photosensitive materials were investigated; and hot spot detection with temperature sensitive phosphorus were investigated. Wafer handling fixtures were developed and are currently in use. (Author)

AD-626 449 Fld. 9/1, 12/2
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
LINEAR FILTER OPTIMIZATION WITH GAME THEORY CONSIDERATIONS,
by M. C. Yovits, and J. L. Jackson. Mar 55, 16p.
Rept. no. TG-240
Contract NOrd-7386

Unclassified report

Portions of this paper prepared for presentation at IRE Convention, New York City, 21-24 Mar 55.

Descriptors: (*Filters (Electromagnetic wave), Optimization), (*Game theory, Filters (Electromagnetic wave)), Signal-to-noise ratio, Functions, Calculus of variations

The optimum reproduction of a signal in the presence of noise by means of linear filters is considered when the signal is unknown. The problem is likened to a game. In such a game the signal spectrum can be considered to be the strategy of one of the participants, while the strategy of the other participant is specified by the transfer function of the filter. The payoff is taken to be the mean square difference between filter output and signal. The signal producer by his choice of spectrum attempts to maximize the difference while the filter designer attempts to minimize it. In order to obtain game theory solutions the optimum transfer function for any fixed signal spectrum and also the optimum signal spectrum for any allowable transfer function are found. The game theory solution is then the intersection of these two functional equations. In order to obtain the optimum transfer function for any fixed signal spectrum in a convenient form a new variational procedure has been developed which yields an integral equation for the amplitude of the transfer function. The form of the relationship is dependent only on the noise spectrum. For simple noise spectra the results are both simple and convenient for game theory solutions.

AD-626 469 Fld. 9/1, 20/12
CFSTI Prices: HC $2.00 MF $0.50
BELL TELEPHONE LABS INC MURRAY HILL NJ
MICROWAVE DIODE RESEARCH.
Interim rept. no. 1, 10 Jun-9 Sep 65,
by J. G. Josenhans, and T. Misawa. Dec 65, 34p.
Rept. no. 22
Contract DA-28-043-AMC-01445 (E) Proj. DA-1P6-22001-A-056
ECOM 01445-22

Unclassified report

Descriptors: (*Microwave equipment, Avalanche diodes), (*Avalanche diodes, Microwave equipment), (*Diodes (Semiconductors), Silicon, Microwave amplifiers, Noise (Radio), Semiconductors, Electrical properties, Electrical impedance, Capacitance, Inductance, Performance (Engineering)

Chapter 1 describes room-temperature microwave measurements that have been made to characterize an epitaxial silicon p-n-n+ avalanche diode in continuous operation. The diode is believed to have an avalanche somewhat distributed throughout the depletion layer as contrasted to the Read model in which the avalanche is confined to a narrow zone within the depletion layer. The diode exhibits a negative conductance over a band in excess of an octave about a center frequency in the 5- to 10-Gc range. However, a large current-dependent susceptive component places constraint on the utilization of this negative-conductance band. The noise power output in the negative-conductance band was functionally related to the bias current; however, the noise figure of a high-gain amplifier was only moderately influenced because of the diode's increased negative conductance with bias current. The typical noise figure of a 10-db amplifier was 45 db. In Chapter 2 a one-dimensional, small-signal analysis of the space-charge region of a p-n junction in which avalanche occurs uniformly is presented. The impedance is found to have a negative real part. The impedance is well represented by a parallel connection of the depletion layer capacitance, an inductance, and a negative resistance. The admittance of the latter two is proportional to the bias current. The magnitude of the negative Q is below ten. The negative resistance is due to an intrinsic instability in the avalanching electron hole plasma. A discussion of the instability and a traveling-wave-tube type of amplification is given.

AD-626 477 Fld. 9/1
CFSTI Prices: HC $3.00 MF $0.75
RAYTHEON CO BURLINGTON MASS MICROWAVE AND POWER TUBE DIV
HIGH EFFICIENCY COOLING AND FACILITY MAINTENANCE (U).
Final rept.,
by L. J. Nichols. Dec 65, 66p. Contract AF30 (602)-3441 ,ARPA Order-388 Proj. AF-8794

Unclassified report

Descriptors: (*Electron tube parts, Cooling), Magnetrons, Diodes (Electron tubes), Cold cathode tubes, Electromagnetic pulses, Materials, Test equipment, Life expectancy, Electron bombardment, Platinum, Thermal diffusion, Surface properties, Performance (Engineering), Maintenance, Test facilities

An evaluation of pulsed peak power Amplitron vanes was carried out in the following four programs. The first program consisted of the design and evaluation of an inverted magnetron diode. During this program a test vehicle suitable for testing vanes at dissipation levels up to 400 kW/sq cm was designed and evaluated. The second program consisted of a study to determine the most suitable materials for pulse tube vanes, and the incorporation of these materials in test vanes. The six most suitable materials for pulse tube vanes were selected and the techniques for incorporating these materials in test vanes were worked out. The third program that was carried out consisted of designing and constructing a diode life test facility which allowed a number of diode tests to be conducted simultaneously. During the fourth program the effects of pulsed electron bombardment of platinum was studied. The effect was studied at five different dissipation density levels. This study confirms that surface stress cracking will occur at dissipation density levels over 100 kW/sq cm at a 10 microsec pulse width. It shows that while there is a large amount of surface roughening at dissipation density levels of 250 kW/sq cm, thousands of hours of operation are possible at dissipation density levels up to 250 kW/sq cm. (Author)

AD-626 482 Fld. 9/1, 13/8
CFSTI Prices: HC $2.00 MF $0.50
WESTON INSTRUMENTS INC NEWARK NJ
A POROUS SUBSTRATE RESISTOR AIMED AT MINIAURIZATION OF METAL-FILM RESISTORS.
Interim development rept. no. 13 (final proj. summary) 1 Sep-30 Nov 65,
by T. Matley, P. M. Gross, R. G. Drewes, and R. E. Busch. 30 Nov 65, 43p. Contract NObsr-87542 Proj. SR-0080303 Task 9636

Unclassified report

Descriptors: (*Resistors, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Resistors), (*Metal films, Resistors), Substrates, Porous materials, Fixed resistors, Electric terminals, Epoxy plastics, Brazing, Metal coatings, Tests, Encapsulation

The new cylindrical substrate was checked for uniformity of weight and weight-to-volume ratio. Reproducibility of metallizing was verified using the atmospheric technique. Fifteen lots of ten units per lot were metallized and variations within each lot and from lot-to-lot were noted. Some of these units were used later for load life and temperature coefficient of resistance testing. Development of the new solder terminal was completed and its quality was compared to the epoxy terminal using especially the 90 degree ratio test. A method of encapsulation was adopted utilizing a ceramic tube, end caps and an epoxy coating. (Author)

AD-626 616 Fld. 9/1
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB

SHORT CUT TO PRINTED CIRCUIT PROTOTYPES,
by F. R. Muccino. Jan 59, 33p. Rept. no. TG-327
Contract NOrd-7386

Unclassified report

Descriptors: (*Printed circuits, Manufacturing methods), Etching, Copper, Laminates

Methods for producting reliable printed circuits for prototype work are discussed. Two methods, based on etching of standard copper-laminate boards are found most practical for small-shop prototypes and are described in detail. The silk-screen process, using hand-cut stencil film is considered better than handdrawing where several identical circuit boards are needed. Step-by-step use of the silk-screen process is given; it is concluded that the process offers a low-cost way of reproducing accurately more than 200 prints per hour with unskilled hands and minimum equipment. (Author)

AD-626 631 Fld. 9/1
CFSTI Prices: HC $1.00 MF $0.50
LFE ELECTRONICS BOSTON MASS
RF DELAY LINE SYSTEM.
Final technical rept., Oct 64-Jun 65,
by Gunars Grabis. Dec 65, 16p. Rept. no. TP-364
Contract AF30 (602)-3577 Proj. AF-5556 Task 555602
RADC TR-65-398

Unclassified report

Descriptors: (*Delay lines, Pulse integrators), Radiofrequency, Very high frequency, Power amplifiers, Transistors, Gain

A report is given on design and development of an RF Delay Line System. Development efforts, which concentrated mainly on the design and development of the system distribution network, were to provide a network which would not attenuate the input signal more than 10 db and would provide sufficient isolation between parallel channels to maintain bandwidth above 8 Mcs. Design requirements of the post delay amplifier were high gain, high output power, and wide bandwidth. Part of the development effort included a search for available state-of-the-art power transistors and the final selection of the 2N3375 type transistor. Transistor cooling and rf radiation problems were solved by using hot tin dipped steel chassis and by separating and chielding each gain stage. (Author)

AD-626 635 Fld. 9/1
CFSTI Prices: HC $1.00 MF $0.50
RADIO CORP OF AMERICA LANCASTER PA ELECTRONIC COMPONENTS AND DEVICES
RESEARCH AND DEVELOPMENT OF HIGH RESOLUTION TELEVISION TUBES.
Interim technical rept. no. 1, 15 Sep-15 Dec 65. 17 Jan 66, 24p. Contract AF33 (615)3008

Unclassified report

Descriptors: (*Cathode ray tubes, Television equipment), (*Television equipment, Cathode ray tubes), Vidicons, Image intensifiers, Manufacturing methods, Design, Electron tubes parts, Cathode ray tube screens, Electron guns, Resolution, Performance (Engineering)

The tube being developed is based on the tube developed on Contract AF33 (615)-2109. The tube design was changed in order to correct some problem areas experienced on the previous contract. A new design for the vidicon section of the tube was studied with the objective of eliminating the field mesh. Beam characteristics of a typical vidicon beam are discussed. Also discussed are comparison of storage surfaces, the effect of dark currents, the effect of camera and tube dimensions on resolving power, and computer programs. (Author)

AD-626 637 Fld. 9/1, 17/2.1
CFSTI Prices: HC $6.00 MF $1.25
MICROWAVE ASSOCIATES INC BURLINGTON MASS
HIGH POWER SEMICONDUCTOR TR DEVICES.
Final rept. 1 Jul 63-31 Jul 65,
by R. H. Brunton,III.. 31 Jul 65, 218p. Rept. no. 8
Contract DA-36-039-AMC-03187 (E) Proj. DA-1P6-22001-A-056

Unclassified report

See also AD-619 679.

Descriptors: (*Transmitter-receivers, Semiconductor devices), (*Semiconductor devices, Transmitterreceivers), Microwave equipment, Limiters, K band, Electronic switches, X band, Diodes (Semiconductor), Varactor diodes, Radiofrequency power, Performance (Engineering), Electrical properties, Packaging

This is the final report on the development of high power Semiconductor K sub U Band Limiters and X sub L Band Switching Devices. The reports presents the program objectives, technical background, theoretical and experimental results and final characteristics of each device. The development effort included both microwave circuit design and semiconductor engineering. Specific efforts were directed toward manufacturing limiter diodes applicable for use at K sub U band. Investigation included the use of packageless semiconductors as well as special miniature diode ceramic packages. Microwave circuits were designed and utilized in order to make full use of the semiconductor diodes characteristics. The results of the program in each area of investigation are discussed and experimental data is given. Final conclusions and recommendations for future engineering development to achieve improvements are presented as a result of the successful accomplishments on this contract. (Author)

AD-625 663 **See Fld. 19/1**

AD-625 717 **See Fld. 13/4**

AD-625 825 **See Fld. 9/5**

AD-625 901 **See Fld. 1/3**

AD-625 907 **See Fld. 1/3**

AD-626 046 **See Fld. 20/3**

AD-626 080 **See Fld. 20/12**

AD-626 161 **See Fld. 14/4**

AD-626 206 **See Fld. 18/8**

AD-626 261 **See Fld. 14/2**

AD-626 327 **See Fld. 9/5**

AD-626 371 **See Fld. 9/2**

AD-626 375 **See Fld. 11/9**

AD-626 389 **See Fld. 20/3**

AD-626 474 **See Fld. 18/8**

9/2. COMPUTERS

AD-625 720 Fld. 9/2
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ARE SMALL, FREE-STANDING COMPUTERS HERE TO STAY.
by F. J. Gruenberger. Dec 65, 9p. Rept. no. P3281

Unclassified report

Presented at Western Regional Meeting of COMMON, Los Angeles, 8 Dec 1965.

Descriptors: (*Computers, Costs), Operation

Computing-power-per-dollar in small machines is considered to be increasing rapidly and will continue to do so. Some of the features now available only through time-sharing will become available on freestanding machines. When that occurs, and when the crossover point in costs is reached (i.e., when it costs the same either way), then attention will focus on the unique advantages of each system of operation.

AD-625 727 Fld. 9/2, 15/3
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
HAMILTON TEST SIMULATION USERS MANUAL.
Technical memo.,
by L. S. Jay. 1 Jan 66, 50p. Rept. no. TM-2589/000/02
Contract AF19 (628)-5166

Unclassified report

Descriptors: (*Instruction manuals, Programming (Computers)), (*Operational readiness, Combat information centers), Computer operators, Punched cards, Punched tape

The Hamilton Test Simulation System (HTSS) provides the capability for the on-site preparation, generation, and processing of simulation tapes for the purpose of testing the Hamilton Combat Center Operational computer programs. This document contains the information necessary for the preparation of all card inputs to the system. Individual chapters include information pertinent to HTSS Master Tape maintenance, HTSS Test tape generation and description, as well as a Computer Operator's Guide discussing equipment requirements, tape drive set-ups, and error and information printouts. (Author)

AD-625 728 Fld. 9/2, 5/1
CFSTI Prices: HC $2.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE
THE PRIORITY PROBLEM,
by Martin Greenberger. Nov 65, 35p. Rept. no. MAC-TR-22
Contract Nonr-4102 (01) Proj. NR-048-189

Unclassified report

Rept. on Proj. MAC. Presented at the National Meeting of the Operations Society of America (27th), Boston, 6 May 65.

Descriptors: (*Computers, Scheduling), Mathematical analysis, Real time, Costs, Nonlinear systems

Priority decisions arise whenever limited facilities must be apportioned among competitive demands for service. A priority operation of contemporary interest is scheduling a time-shared computer among its concurrent users. Service requirements are not known in advance of execution. To keep response times short for small requests, service intervals are partitioned and segments are served separately in round-robin fashion. A mathematical analysis pinpoints the tradeoff between overhead and discrimination, implicit in this procedure, and allows alternate strategies to be costed. Extensions of the simple round-robin procedure are suggested, the objectives of time sharing are reviewed, and implications are drawn for the design of future priority and pricing systems. (Author)

AD-625 751 Fld. 9/2
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SELF-INSTRUCTIONAL JOVIAL MANUAL. CHAPTERS 5 AND 6.

Professional paper,
by Donald I. Cutler. 20 Dec 65, 47p. Rept. no. SP-2214/000/00A

Unclassified report

See also AD-623 771.

Descriptors: (*Programming languages, Instructional manuals)

AD-625 764 Fld. 9/2
CFSTI Prices: HC $2.00 MF $0.50
MITRE CORP BEDFORD MASS
BAR-MULTIPLIER AND ITS GENERALIZATION,
by Satio Okada. Dec 65, 42p. Rept. no. TM-04026
Contract AF19 (628)-5165 Proj. AF-7070
ESD TDR-64-172

Unclassified report

Descriptors: (*Analog computers, Computer logic), Digital computers, Number theory, Geometry

A new and simple device, similar to an abacus, was invented by a Chinese mathematician; it is used for multiplication, division, and extracting square roots. The underlying idea is abstracted and generalized for possible application to contemporary computers in order to reduce computing time. (Author)

AD-625 859 Fld. 9/2, 17/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
SATURATION PROCESSING: AN OPTIMIZED APPROACH TO A MODULAR COMPUTING SYSTEM.
Technical rept.,
by William C. Cave, and Robert M. Dunn. Nov 65, 24p. Rept. no. ECOM-2636
Proj. DA-1X6-40603-D494 Task 1X6-40603-D494-03

Unclassified report

Descriptors: (*Digital computers, Optimization), (*Data processing systems, Digital computers), Command + control systems, Information theory, Communication systems, Control, Modules (Electronics)

Saturation processing is an optimal method for allocating resources which are maintained in a redundant fashion throughout a modular computing system. Such a computing system is very desirable where organizational flexibility and gradual degradation are of importance. However, the problem of communications and control within such systems severely limits their practicality. Saturation processing is an optimized approach to these problems, seeking to take maximum advantage of a modular computing system. The logical framework for a modular computing system utilizing only two module types is described. Discussion of communications and control are given for this system using saturation processing. These discussions are augmented with methods and examples which point out a distinct reduction of these problems. Some conclusions are derived which indicate an inverse relationship between redundance of resources and required amount of executive control. (Author)

AD-625 860 Fld. 9/2
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
COMPUTER TECHNOLOGY,
by Stuart Hibben, and Boris Doncov. 1 Nov 65, 87p. Rept. no. ATD-P-65-97.
TT 66-60161

Unclassified report

Compilation of abstracts selected from Soviet opensource literature. See also AD-622 788.

Descriptors: (*Computers, USSR), Automation, Cybernetics, Electronic equipment, Electrical equipment, Input-output devices, Analog computers, Digital computers, Electrical engineering, Reviews, Abstracts, Processing, Microminiaturization (Electronics)

Abstracts contained in the report were selected from Soviet open-source literature recently made available at the Aerospace Technology Division and the Library of Congress. Information not directly related to the assigned subject has been included because of its broad implications for study in this field. The 75 abstracts are arranged alphabetically by author within each of the following categories: components, design, applications, and associated systems. A recent review of three Soviet articles on microminiaturization is included in the Appendix. (Author)

AD-625 896 Fld. 9/2
CFSTI Prices: HC $5.00 MF $1.00
ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE
QUARTERLY TECHNICAL PROGRESS REPORT, APRIL, MAY, JUNE 1965.
1965, 175p. Rept. no. COO-415-1053 ,COO-1469-0010

Unclassified report

Descriptors: (*Computers, Scientific research), Analog-digital computers, Circuits, Pattern recognition, Real time, Bubble chambers, Scanning, Photographic film, Electrooptics

Contents: Circuit research program; Illinois pattern recognition computer: ILLIAC III; Illiac II research and service, use, and program development; Computer systems research; Computational physics; IBM 7094-1401 system; General laboratory information.

AD-626 143 Fld. 9/2, 5/7
CFSTI Prices: HC $1.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS DATA SCIENCES LAB
MACHINE-AIDED DESIGN OF CONTEXT-FREE GRAMMARS.
Physical and mathematical sciences research papers,
by Thomas G. Evans. Oct 65, 25p. Rept. no. PMSRP-152
Proj. AF-4641 Task 464102
AFCRL 65-747

Unclassified report

Descriptors: (*Context free grammars, Design), Syntax, Analysis, Programming languages, Grammars

A program has been developed to assist an on-line user in the modification and testing of an arbitrary context-free phrase-structure grammar. Commands are available to the user permitting him to insert or delete grammar rules, define test strings, or attempt to parse specified test strings according to the current grammar. Further commands give the user extensive control over what output and diagnostic information he receives from the program and provide facilities for isolating and diagnosing difficulties with the grammar. One version of the program is written entirely in LISP and hence is available for use on any machine for which a LISP processor exists and suitable on-line access is possible. This report is a revision of a paper presented at the National Conference of the Association for Computing Machinery, Cleveland, Ohio, August, 1965. (Author)

AD-626 155 Fld. 9/2, 5/8, 6/4
CFSTI Prices: HC $6.00 MF $1.25
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
A SURVEY OF PICTORIAL DATA PROCESSING TECHNIQUES AND EQUIPMENTS.
Technical rept.,
by Andries van Dam. Aug 65, 224p. Rept. no. 66-19
Contract Nonr-551 (40)

Unclassified report

Descriptors: (*Data processing systems, Graphics), State-of-the-art reviews, Real time, Display systems, Facsimile transmission, Information retrieval, Analog systems, Pattern recognition, Man-machine systems, Photographic processing equipment, Optical equipment, Microphotography, Subject indexing, Photographic film, thermoplastics, Digital systems, Pictures, Digital recording systems

The material presented serves as a state-of-the-art report on pictorial data processing techniques and equipments; however, it is not an exhaustive report nor does it cover all the areas of pictorial data processing. The report is directed primarily to the present and future needs of the engineering data generator and user who wants to communicate in real or near real-time with his environment of digital processors. The areas covered include (1) display: consoles (and printer plotters); (2) transmission (facsimile); (3) storage and retrieval (analog); (4) optical pattern recognition; (5) graphical man/machine interaction. (Author)

AD-626 191 Fld. 9/2
CFSTI Prices: HC $2.00 MF $0.50
MITRE CORP BEDFORD MASS
FAST LOGIC CIRCUIT TEST ASSEMBLY,
by J. Liu, and N. S. Zimbel. Dec 65, 30p. Rept. no. WO6874/0000/010/00
Contract AF19 (628)-5165 Proj. AF-5080
ESD TR-64-637

Unclassified report

Descriptors: (*Computer logic, Test equipment (Electronics)), Switching circuits, Delay lines, Counting methods, Digital computers

This document describes the Fast Logic Circuit Test Assembly built to evaluate the system operating characteristics of nanosecond switching circuits which have been developed at The MITRE Corporation. The Test Assembly, which includes most of the classes of logic functions which might be encountered in a full scale serial or parallel computer, will also serve as a vehicle for evaluation of circuit reliability and for signal and power distribution methods. The Test Assembly includes two serial registers which use electromagnetic delay line storage. The shift registers, associated with these delay lines to implement the serial-to-parallel conversion or vice versa, shift at a 100-mc rate. Also included, in addition to a 100-mc counter and various control networks, is an 8-bit parallel adder which may be expanded using identical adder modules to form a 64-bit adder with 30-nanosecond addition time. (Author)

AD-626 200 Fld. 9/2, 9/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
ENCODER EVALUATION EQUIPMENT,
by Claude W. Brown, and Sara G. Valdivia. Oct 65, 43p. Rept. no. NOTS-TP-3800
Task RMWC-24-088/216-1/F009-04-02

Unclassified report

Descriptors: (*Coding, Electronic equipment), (*Test equipment (Electronics), Data processing systems), Data storage systems, Recording systems, Reading machines, Computer logic, Timing circuits, Systems engineering, Control systems, Weapon systems, Shipborne

Equipment used to evaluate various kinds of shaftangle encoders for suitability in a shipboard weaponcontrol system is described. (Author)

AD-626 204 Fld. 9/2, 12/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

A CASE STUDY OF THE DISCRETE OPTIMUM FILTER-CONTROLLER PROBLEM.
Technical rept.,
by James S. Demetry, Robert D. Strum, and Harold A.Titus. Nov 65, 44p. Rept. no. TR-57
Unclassified report

Descriptors: (*Control system, Optimization), Automatic, Feedback, Computers, Simulation, Dynamic programming, Gain, Matrix algebra, Synthesis, Functions, Sampling

An example is given of the steps and calculations necessary to the synthesis of the discrete optimum controller and Kalman filter for the control of a linear, timeinvariant plant whose state is only partially observable. The plant is subject to random excitation, and the observables are contaminated by random measurement noise. The optimum control is a linear function of the best estimate of the system state variables. The controller gains are obtained from the steady-state solution of a set of recursion equations arising from a dynamic programming approach to the minimization of a quadratic index of performance. The optimum filter is essentially a model of the plant. The state of the model is the best current estimate of the state of the plant. The estimate is updated at each sampling instant by taking the difference between the observed state of the plant and the predicted state of the model. This difference vector is multiplied by a 'gain' matri to adjust the model. The elements of the filter gain matrix are obtained from the steady-state solution of a set of recursion equations developed by Kalman.

AD-626 319 Fld. 9/2
CFSTI Prices: HC $1.00 MF $0.50
AUTOMATIC DATA FIELD SYSTEMS COMMAND FORT BELVOIR VA
ADP SYSTEMS MAINTENANCE.
Technical documentary rept.,
by Fletcher J. Buckley. Dec 65, 23p. Rept. no. 04-01-01
Unclassified report

Descriptors: (*Computers, Maintenance), Army equipment, Reliability (Electronics), Failure (Electronics), Effectiveness

Maintenance of an ADP system presents some special problems due to the complexity of the machines. As a part of the Army's program, small-size, large-scale computers are planned for placement throughout the Field Army. An increase in combat effectiveness can be achieved if these machines can be maintained while in a tactical environment. This paper identifies several specific maintenance problem areas in which additional work could be initiated to solve some outstanding maintenance problems. It also considers possible solutions to the problem of field repair and highlights some current machine diagnostic efforts and techniques. (Author)

AD-626 346 Fld. 9/2, 17/7, 22/2
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
ON LINE COMPUTER CONTROL TECHNIQUES AND THEIR APPLICATION TO RE-ENTRY AEROSPACE VEHICLE CONTROL,
by Francis H. Kishi. 1964, 121p. Contract AF33 (657)-7154 Grant ,AF-AFOSR-62-68 Proj. AF-500 Task 82181
AFOSR 65-1002
Unclassified report

Prepared in cooperation with TRW Space Technology Labs., Redondo Beach, Calif.

Availability: Published in Advances in Control Systems, Theory and Application v1 p245-357 (New York Academic Press) 1964. Copies to DDC users only.

Descriptors: (*Reentry vehicles, Navigation computers), (*Attitude control systems, Reentry vehicles), (*Computers, Control systems), Adaptive control systems, Optimization

The major concern of this work has been the development of tools necessary to perform adaptation in a control problem with an unknown process. The approach taken to perform adaptive control was to measure the process through observation of the input-output data and to compute optimal controls on the basis of estimated parameter values and estimated state-variables. Three phases to this approach to adaptive controls are discussed: (1) parameter estimation; (2) state-variable estimation; and (3) computation of optimal controls. The three phases are studied separately indicating approaches which can accomplish these tasks. In the area of optimal control computations, methods presently available for the linear process case with quadratic performance criterion are summarized. For the parameter estimation phase two approaches are studied: (1) the explicit mathematical relation method, and (2) the learning model method. For the state variable estimation phase, Kalman's recursive filtering technique was adopted. Finally, an outline is given to apply the optimal-adaptive approach to a phase of the re-entry problem. (Author)

AD-626 371 Fld. 9/2, 13/12, 9/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
CO2 SYSTEMS FOR PROTECTION OF COMPUTERS AND ELECTRONIC EQUIPMENT.
Interim technical note, Jul 64-Apr 65,
by Cyrl W. Terry, and John J. Bayles. 10 Dec 65, 31p. Rept. no. TN-N-663
Proj. Y-F015-07-03-204
Unclassified report

Descriptors: (*Computers, Fire safety), (*Fire safety, Computers), (*Carbon dioxide, Fire safety), Electronic equipment, Fires, Fire alarm systems, Sprinklers, Fire extinguishers

The note summarizes information obtained through a survey of literature and through Laboratory tests of C02 systems designed to control fires in electronic equipment. It reviews basic engineering considerations pertinent to the task. Analyses of preliminary test results are included. (Author)

AD-626 412 Fld. 9/2, 22/2, 20/11
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROELASTIC AND STRUCTURES RESEARCH LAB
DASHER I: A PROGRAM FOR THE DYNAMIC ANALYSIS OF SHELLS OF REVOLUTION,
by Joseph A. Wolf,Jr., and Evelyn Mack. Oct 65, 88p. Rept. no. ASRL-TR-121-11
Contract AF04 (694)-427
Unclassified report

Descriptors: (*Programming (Computers), Dynamics), (*Dynamics, Bodies of revolution), (*Reentry vehicles, Aerodynamic loading), Deformation, Structural shells, Cylindrical bodies

This report presents an analysis and a computer program which permits determining the transient deformation of an undamped system which contains both inertial and elastic coupling by a time-wise step-by-step computational process. The program is developed for the purpose of Dynamic Analysis of Shells of Revolution (DASHER). The input to the program consists of the stiffness and consistent-mass matrices which are derived from a finite-element representation of the structure. Three examples are presented to illustrate the application of this program. One of these concerns the dynamic deformations of a simply-supported beam subjected to a uniform step-function loading; the second concerns the dynamic deformations of a circular cylindrical shell under a uniformly distributed external pressure having a half-sine shape time history; and the third is similar to the second except that the axisymmetric pressure loading on the cylinder has a sin (Pi z)/L longitudinal distribution. Guidance for the selection of an appropriate time interval for this type of step-by-step calculation is provided. (Author)

AD-625 673 See Fld. 9/5
AD-625 710 See Fld. 1/2
AD-625 719 See Fld. 6/4
AD-625 724 See Fld. 14/4
AD-625 730 See Fld. 17/2
AD-625 731 See Fld. 20/14
AD-625 777 See Fld. 5/7
AD-625 827 See Fld. 12/1
AD-625 866 See Fld. 13/12
AD-625 924 See Fld. 5/2
AD-626 032 See Fld. 5/1
AD-626 145 See Fld. 5/2
AD-626 214 See Fld. 20/11
AD-626 422 See Fld. 15/5
AD-626 472 See Fld. 5/7
AD-626 554 See Fld. 5/8
AD-626 555 See Fld. 5/2
AD-626 574 See Fld. 16/2

9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

AD-625 678 Fld. 9/3, 9/5
FRICK CHEMICAL LAB PRINCETON UNIV N J
VERSATILE TRIANGULAR SWEEP GENERATOR.
by W. D. Weir, and C. G. Enke. 31 Dec 63, 6p.
Contract AF-AFOSR-151-63
AFOSR 65-2197
Unclassified report

Availability: Published in The Review of Scientific Instruments v35 n7 p833-7 Jul 1964. Copies to DDC users only.

Descriptors: (*Sweep generators, Design), Waveform generators, Linear systems, Wiring diagrams, Design, Test equipment (Electronics)

A versatile, all-electronic cyclic linear-sweep generator is described. This device produces a symmetric or asymmetric triangular waveform of high quality with sweep rates continuously variable from 5 mV/sec to 2000 V/sec, independent of amplitude; positive and negative sweep limits are independently variable from 0-3 V relative to a reference level which is itself variable with respect to signal ground. Provision is made for controlling the output voltage at a preset level prior to initiation of the sweep, and the sense of the initial sweep may be selected. The cyclic sweep may be halted at either limit, either mechanically or electronically. An auxiliary output provides a square wave with peak-topeak amplitude equal to the peak-to-peak amplitude of the triangular waveform, based at signal ground, and with period regulated by the sweep rate controls. (Author)

AD-625 694 Fld. 9/3, 20/12, 9/4, 20/14
CFSTI Prices: HC $5.00 MF $1.00
LINCOLN LAB MASS INST OF TECH LEXINGTON
ABSTRACTS, SCIENTIFIC AND ENGINEERING PAPERS.
Abstracts of journal articles, meeting speeches and theses, 15 Apr 62-15 Apr 65.

Jun 65. 188p. Contract AF19 (628)-500
ESD TDR-65-227

Unclassified report

Descriptors: (*Electronics, Abstracts), (*Solid state physics, Abstracts), (*Abstracts, Electronics), Electronics laboratories, Semiconductors, Lasers, Radar, Nuclear explosions, Superconductivity, Communication systems, Semiconductor devices, Materials, Intermetallic compounds, Information theory, Plasma medium, Films, Electromagnetic waves

The publication contains abstracts of journal articles written by Lincoln Laboratory authors and published or accepted for publication between 15 April 1962 and 15 April 1965. Included also are abstracts of these submitted for advanced degrees during the same period.

AD-625 797 Fld. 9/3, 20/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF AMPLIFYING ELECTROMAGNETIC OSCILLATIONS,
by I. V. Lebedev. 27 Oct 65, 7p. Rept. no. FTD-TT-65-807
TT 66-60144

Unclassified report

Unedited rough draft trans. of Patent, (USSR) 167 223, appl. no. 895751-26-25, 20 Apr 64.

Descriptors: (*Electromagnetic fields, Oscillation), (*Amplifiers, Electromagnetic fields), Electric fields, Electrons, Magnetic fields, Cathodes (Electron tubes), Patents, USSR

A method of amplifying electromagnetic oscillations with the aid of a closed or open electron flux moving in crossed electric and magnetic fields is presented. To improve the coefficient of amplification in connection with high efficient of the amplifier and a broad band of frequencies one one uses a retarding system which works in a mode of positive or negative dispersion in the form of two nonresonance sections not connected with each other or weakly connected by an electromagnetic field. An input UHF signal is passed into the retarding system to assure the fulfilling of the rule of buncher by one the sections which is the negative electrode. The second section which plays the role of the positive electrode (anode) of the amplifier and serves for selection of the potential energy from the bunched electron flux one arranges parallel to or concentric with the former with the shifting of the impedance surface in the direction of the electron flux movement. The electron flux is injected into the space of interaction at a short distance from the surface of the first section with the aid of a separate electron-optical system.

AD-625 673 **See Fld. 9/5**

AD-625 733 **See Fld. 9/1**

AD-626 283 **See Fld. 5/9**

AD-626 284 **See Fld. 5/9**

AD-626 421 **See Fld. 17/2**

9/4. INFORMATION THEORY

AD-626 162 Fld. 9/4
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
CANONICALLY OPTIMUM THRESHOLD DETECTION,
by David Middleton. Nov 65, 87p. Rept. no. rm-4687-PR
Contract AF49 (638)-700

Unclassified report

Descriptors: (*Signals, Communication equipment), (*Comminication equipment, Optimization), Signal-tonoise ratio, Information theory, Decision theory, Design, Radar receivers, Sonar receivers, Seismometers, Radar signals, Sonar signals, Noise (Radar), Demodulation

Systematic methods are developed for determining best approximations to the theoretically ideal, optimum detector for signals in noise. The methods provide, for the first time, a basis for design approximations, and a means for comparing and evaluating actual systems with their ideal counterparts. Emphasis is on providing explicit detector structures and showing how, and to what degree, such structures yield optimum or nearoptimum results. Applications to radar, sonar, seismology, or any other signal detection in noise, are immediate. (Author)

AD-626 241 Fld. 9/4, 9/6
MITRE CORP BEDFORD MASS
ANALYSIS OF A PSK SYSTEM WITH A TRANSMITTED REFERENCE TONE,
by Myron Leiter, and Julian J. Bussgang. 1964, 9p. Contract AF19 (628)-2390
ESD TR-65-82

Unclassified report

Prepared in cooperation with Harvard Univ., Cambridge, Mass., Contract Nonr-1866 (16)

Availability: Published in 1965 IEEE International Convention Reçord, p17 p194-201. Copies to DDC users only.

Descriptors: (*Phase shift, Communication equipment), Radio transmission, Phase detectors, Performance (Engineering), Power, Errors

The performance is analyzed of a communications system in which a reference tone is transmitted at a frequency adjacent to the phase keyed tone. The probability of error for a maximum likelihood receiver is obtained in an m-phase system of this type. The most advantageous division of power between the phase keyed tone and the reference tone is analyzed as a function of various system parameters. Error performance and optimum power division are examined when several keyed tones use a common reference tone. The change in error performance due to differential phase delay between a data tone and the reference tone is computed. Some results of an analysis of double errors are reported. (Author)

AD-626 388 Fld. 9/4
CFSTI Prices: HC $5.00 MF $1.00
WESTINGHOUSE ELECTRIC CORP BALTIMORE MD
ANALOG CODING.
Final technical rept., 1 Apr 64-Jun 65,
by Alvin E. Fein, Ralph M. Heller, Carl W. Helstrom, Garry Marquart, and A. Herbert Trock.
Dec 65, 161p. Rept. no. G.O.-38090
Contract AF30 (602)-3311 Proj. AF-4519 Task 451902
RADC TR-65-311

Unclassified report

Descriptors: (*Information theory, Coding), (*Coding, Information theory), Analog systems, Data transmission systems, Errors, Corrections, Statistical analysis

Several techniques for reducing the error in the transmission of continuous information are investigated. In self-contained appendixes, the following topics are studied: Coding Networks, Predictive Coding, ForcedErasure Decoding, Mappings, Channel Characterization and Simulation Techniques, and Code Construction. The minimum mean-square errors in some systems that transmit and process continuous information by solely linear operations are compared with the absolutely minimum mean-square error predicted by information theory. The linear encoding of sampled data is also studied. Several results relating to the erasure reconstruction spectrum of generalized group codes are derived. Both the evaluation difficulties of and the future study directions of Forced-Erasure Decoding are discussed. The performance of certain information sources is calculated. A hybrid system for transmitting sampled data is also studied. Techniques for the digital simulation of stochastic processes are discussed and some investigations are suggested. Generalizations of code construction techniques were also studied. The value of these techniques is in hybrid coding situations. (Author)

AD-626 463 Fld. 9/4
LITTON SYSTEMS INC WALTHAM MASS INFORMATION SCIENCES LAB
MINIMUM GABOR BANDWIDTH OF M ORTHOGONAL SIGNALS.
Revised ed.,
by A. H. Nuttall. 10 Apr 65, 5p. Contract Nonr-3320 (00)

Unclassified report

Availability: Published in IEEE Transactions on Information Theory vIT11 n3 p440-4 Jul 1965. Copies to DDC users only.

Descriptors: (*Band width, Radio signals), Information theory, Optimization, Data transmission systems, Matrix algebra

The minimum Gabor bandwidth of M orthogonal real signals which together occupy a given time interval is derived. For special values of M, one form of the optimum set of M signals is specified. Interrelations of the Gabor definition of bandwidth to other definitions are also discussed. (Author)

AD-625 694 **See Fld. 9/3**

AD-626 200 **See Fld. 9/2**

AD-626 362 **See Fld. 9/1**

AD-626 531 **See Fld. 5/10**

9/5. SUBSYSTEMS

AD-625 660 Fld. 9/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
HIGH SPEED POWER SWITCHING SYSTEM.
Technical note for Jun-Sep 65,
by Richard Donaldson. Nov 65, 11p. Rept. no. TN-786
Proj. NCEL-Y-F015-12-08-004

Unclassified report

Descriptors: (*Switching circuits, Power supplies), Feasibility studies, Transmission lines, Electric switches, Phase detectors, Reliability

The operation of critical electronic equipments at Naval installations is impaired by very brief power discontinuities. A feasibility study was made of developing a suitable switching system. Details on the system and circuits of a preliminary breadboarded model 6 millisecond, 3 KVA power source switching system are given.

AD-625 673 Fld. 9/5, 9/2, 9/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
OPTIMUM PREFILTERING IN SAMPLED DATA SYSTEMS WITH READ-IN JITTER,
by Bede Liu, and Robert E. Kahn. 1965, 8p.
Contract DA-36-039-AMC-03200 (E) Grant, NSF-GP-2495

Unclassified report

Prepared in cooperation with Princeton Univ., N. J. Dept. of Electrical Engineering, Grant NSF-GP-1647.

Availability: Published in IEEE International

206-708 O-66-5

Convention Record pt7 p127-33 1965. Copies to DDC users only.

Descriptors: (*Filters (Electromagnetic wave), Data processing systems), (*Optimization, Filters (Electromagnetic wave)), Sampling, Information theory, Noise (Radio), Frequency, Stability, High frequency, Extremely low frequency

This paper treats the problem of the simultaneous optimization of the pre-sampling filter and the post-sampling filter in a sampling and reconstruction scheme where jitter is present at the sampler. The cases of high frequency jitter are considered. The optimum filters with read-in jitter are determined and the minimum mean-squared errors are calculated. It is shown that in both cases the optimum prefilter limits the input spectrum to an angular frequency band of total width 2 pi r where r is the sampling rate. (Author)

AD-625 738 Fld. 9/5
MITRE CORP BEDFORD MASS
ERROR ANALYSIS, CALIBRATION, AND THE POLARIZATION SCATTERING MATRIX.
Revised ed.,
by Samuel H. Bickel, and J. F. A. Ormsby. 10 May 65, 6p. Rept. no. MTP-3
Contract AF19 (628)-2390 ,ARPA Order-596
ESD TR-65-116
Unclassified report

Availability: Published in Proceedings of the IEEE v53 n8 p1087-9 Aug 1965. Copies to DDC users only.

Descriptors: (*Radar antennas, Calibration), (*Polarization, S-matrix), (*S-matrix, Errors), Scattering, Electromagnetic wave reflections, Matrix algebra, Magnetic-optic effect

In conjunction with the polarization scattering matrix, an error analysis is developed for first-order errors. A set of constraints on the various error quantities is established for a passive antenna. The effects for dissipative and nondissipative errors, together with perturbations due to deviation of the scatterer from the main beam axis and due to thermal noise, is included. The influence or lack of it, of these errors on polarization invariant quantities, rotation about the line of sight, and polarization axial ratios is explicitly developed. Emphasis is also given to calibration procedures for taking account of the various errors as well as Faraday rotation, if present. The essential dependencies are exposed, and the features of both a two-body and a one-body technique are given. (Author)

AD-625 750 Fld. 9/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE LAB WHITE OAK MD
THE DEVELOPMENT OF THE FERROMAGNETIC MICROWAVE AMPLIFIER,
by Albert D. Krall, and Edward T. Hooper,Jr..
7 Oct 65, 25p. Rept. no. NOLTR-65-187
Unclassified report

Descriptors: (*Microwave amplifiers, Ferromagnetic materials), Pumping (Electronics), Yttrium compounds, Iron compounds, Garnet, C band, Gain, Bandwidth, Noise (Radio), Theory, Semiconductor devices

The history and operation of the ferromagnetic microwave amplifier are briefly reviewed. A nonmathematical discussion of the various modulation processes involved in amplification is developed. The application of double pumping to the amplifier is treated as part of the modulation processes and a detailed description of an improved amplifier along with the experimental performance figure is given. (Author)

AD-625 766 Fld. 9/5
CFSTI Prices: HC $2.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
LOW-NOISE L-BAND (WIDEBAND) TRANSISTOR AMPLIFIER.
Quarterly technical rept. no. 5, 1 Jun-31 Aug 65, by Leslie W. Read. Oct 65, 36p. Rept. no. TI-03-65-108
Contract DA-28-043-AMC-00109 (E) Proj. DA-1P6-22001-A-056-04-32
Unclassified report

See also AD-624 614.

Descriptors: (*Transistor amplifiers, L band), Noise (Radio), Broadband, Standing wave ratios, Coupling circuits, Impedance matching, Gain

This is a report of research and development leading to the fabrication of exploratory development models of extremely wideband transistor amplifiers at L-band frequencies. The work effort has been directed toward: (1) device characterization; (2) evaluation of coupler configurations; and (3) the fabrication and evaluation of a single-stage amplifier that uses two four-section branch-line couplers and transistors that are similar to the L-148a. The results of the work performed are: (1) the TI-line (Reg) package does not distort device characteristics too severely; and (2) the branch-line coupler may be too large for use in this program, and TEM couplers require less space but present fabrication problems because of line widths and spacing. The following conclusions have been drawn: (1) the TI-Line (Reg.) package is satisfactory for use at L-band frequencies; (2) further work is necessary before the best coupler configuration can be determined; and (3) the problem of gain compensation must be studied more intensively; the coupling should be tighter than 3 db at midband to hold the average VSWR at a minimum. (Author)

AD-625 768 Fld. 9/5
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF ELECTROPHYSICS
THE INTERCHANGE OF SOURCE AND DETECTOR IN LOW-POWER MICROWAVE NETWORK MEASUREMENTS,
Revised ed.,
by H. M. Altschuler. 19 Aug 64, 8p. Contract AF-AFOSR-62-295
AFOSR 65-2400
Unclassified report

Revision of manuscript submitted 11 Jun 64.

Availability: Published in IEEE Transactions on Microwave Theory and Techniques vMTT-13 n1 p84-90 1 Jan 1965. Copies to DDC users only.

Descriptors: (*Microwave bridges, Impedance bridges), (*Impedance bridges, Measurement), Microwave networks, Diodes, Radiofrequency generators, Electrical impedance

The technique for interchanging generator and detector in the impedance measurement of microwave one-ports is a useful, known procedure often applied when low powers are indicated. The necessary and sufficient conditions for the validity of such measurements are examined critically and direct extensions of this technique to measurements of reciprocal two-ports are given. A completely separate analysis is necessary when such an interchange is made in the case of an interference bridge which is to be used for the determination of the scattering parameters of arbitrary (active or passive, and reciprocal or nonreciprocal) two-ports. This analysis, presented in detail, results in a new low-power-level version of a method of measuring arbitrary two-ports as outlined in an earlier paper. The measurement technique and the subsequent data analysis of the two versions are found to be identical, except that two scattering parameters appear in interchanged positions. (Author)

AD-625 780 Fld. 9/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HORN ANTENNA WITH A COAXIAL LEAD,
by L. N. Luk. 27 Oct 65, 6p. Rept. no. FTD-TT-65-818
TT 66-60132
Unclassified report

Unedited rough draft trans. of Patent (USSR) 165 786, appl. no. 869276/26-9, 7 Dec 63.

Descriptors: (*Horn antennas, Design), (*Coaxial cables, Horn antennas), Patents, Waveguides, Antenna feeds, Transmission lines, USSR

A horn antenna with a coaxial lead (input) for the purpose of extending the range in the direction of higher frequencies is presented. A right-angle waveguide with a gradually increasing transverse section is used to join the coaxial transmission line (feeder) to the horn.

AD-625 795 Fld. 9/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HIGH-VOLTAGE NANOSECOND PULSE OSCILLATOR,
by A. S. Nasibov, V. L. Lomakin, and V. G. Bagramov. 21 Oct 65, 7p. Rept. no. FTD-TT-65-630
TT 66-60142
Unclassified report

Unedited rough draft trans. of patent (USSR) 168 754, appl. 859577/26-9, 3 Oct 63, 2p.

Descriptors: (*Microwave oscillators, Pulse generators), (*Pulse generators, Microwave generators), Networks, Thyratrons, Transmission lines, Patents, USSR

A generator of nanosecond high-voltage pulses which contains a shaping line, a discharge pulse thyratron, a transmitting line designed on coaxial cables, and a correction circuit is described. A twostep forming line shunted by capacitance is connected in parallel to a discharge thyratron to increase the amplitude of the pulse and as a preliminary correction of its plane part.

AD-625 825 Fld. 9/5, 9/1
CFSTI Prices: HC $5.00 MF $1.00
MASSACHUSETTS INST OF TECH CAMBRIDGE ELECTRONIC SYSTEMS LAB
A HIGH-POWER SEMICONDUCTOR-MAGNETIC PULSE-GENERATOR CIRCUIT,
by Godfrey T. Coate, and Laurence R. Swain. Oct 65, 158p. Rept. no. ESL-R-246
Contract AF33 (615)-1139 ,AF33 (657)-7644
Proj. DSR-9979 ,AF-5042 Task 504211
Unclassified report

Descriptors: (*Pulse generators, Semiconductor devices), (*Semiconductor devices, Magnetic cores), (*Circuits, Pulse generators), Radar pulses, Rectifiers, Magnetic modulators, Transformers, Saturable reactors, Voltage regulators, Inductance

A circuit for generating high-power, high-voltage pulse trains is described that uses silicon controlled rectifiers for high-current, low-voltage power switching, and inductors and transformers having saturable-magnetic cores for high-voltage, high-speed switching. Figures of merit for saturable-inductor switches and a measure of power-switching capacity for controlled rectifiers are determined which provide a characterization of these devices that is especially useful for design purposes. A step-by-step circuit-design procedure is presented that is flexible enough so that selected performance attributes (such as smallest size and weight, or highest efficiency) can be emphasized by the designer. A laboratory breadboard semiconductor-magnetic pulse generator producing 1700 average watts in 1.6-microsecond pulses of over 1 megawatt peak power is described as an illustration of the circuit technique. (Author)

AD-625 899 Fld. 9/5
CFSTI Prices: HC $6.00 MF $1.25
GENERAL ELECTRIC CO SANTA BARBARA CALIF RADIO GUIDANCE OPERATION
ANTENNA DESIGN AND DEVELOPMENT.
Final design rept. on Readiness Program.
28 Dec 65, 204p. Rept. no. WTR-65L-157
Contract AF04 (695)-476
Unclassified report

Descriptors: (*Guided missile antennas, Slot antennas), Guided missile tracking systems, Antenna apertures, Antenna radiation patterns, Gain, Standing wave ratios, Antenna components, Safety

This report covers the design and development of a missileborne range safety antenna system for installation on the Series E/F Atlas vehicle. The antenna system is designed to operate in conjunction with the General Electric Radio Tracking System (GERTS) to provide range safety information for Atlas missiles launched from the Western Test Range. Antenna pattern requirements were derived from an integrated system analysis of missile launches associated with the 'Readiness Program'. This program requires yaw maneuvers during the sustainer portion of flight, creating 'dog-leg' trajectories for which the existing range safety antenna does not provide adequate pattern coverage. Existing 15in, 6in and 4in traveling wave slot designs were evaluated and tested. It was determined that the 4in slot skewed 20 degrees and tilted 15 degrees would satisfy requirements. Utilization of the 4in aperture made possible the use of an existing coupler design to satisfy ground support equipment requirements. Extensive radiation measurements of both the 4in dog-leg antenna and the existing 15in GERTS antenna were made for full-scale simulations of the Atlas vehicle in both its booster and sustainer configurations.

AD-625 908 Fld. 9/5, 20/4
CFSTI Prices: HC $4.00 MF $1.00
FAIRCHILD HILLER CORP FARMINGDALE N Y REPUBLIC AVIATION DIV
PRELIMINARY DESIGN STUDY OF A FLAT PLATE REFLECTOR AND SUPPORT UNIT.
Final rept. 1 Mar-15 Sep 65,
by Stanislaus Dubowski, and Jung Git Chung. 15 Oct 65, 138p. Rept. no. FHR-1665-7
Contract AF19 (628)-2995 Proj. AF-4600 ,AF-0000 Task 460007 ,000012
AFCRL 65-763
Unclassified report

See also AD-602 126.

Descriptors: (*Antenna configurations, Tests), (*Aerodynamic characteristics, Antenna configurations), Antenna components, Reflectors, Antenna arrays, Aerodynamic loading

Aerodynamic measurements are presented based on open field aerodynamic testing of a mesh surfaced, square shaped, flat plate reflector. Forces and moments were measured on the flat plate in an isolated condition and when located at various positions within an array of 24 similar flat plates and support units. All tests were conducted on open ground and data was recorded during prevailing wind conditions in the natural environment. The extraneous loads produced by the dynamics of the system were filtered by an averaging process over five data points for the steady state values. Array locations are shown to increase the isolated forces by a factor of 4 and the isolated moments by a factor of 50 percent due to the induction effects from adjacent plates. Preliminary design airloads and moments for full scale plates of a similar construction, forming a quadrant of the MultiPlate Antenna, are presented. Implications of the test results related to a full scale, four lobe, Multi-Plate Antenna are discussed. (Author)

AD-625 944 Fld. 9/5, 17/3
CFSTI Prices: HC $2.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
A DUAL-MODE PHASE-LOCKED LOOP.
by Charles A. Baird,Jr.. 30 Sep 65, 37p. Rept. no. TM-65-48
Proj. DA-1X242106D676 ,HDL-56400
Unclassified report

Descriptors: (*Phase-locked systems, Tracking), Narrowband, Filters (Electromagnetic wave), Signal-tonoise ratio, Detection, Target acquisition, Guidance, Simulation, Analog computers

A dual-mode phase-locked loop is described, and its feasibility in a noisy environment is studied. This study is made through analog computer simulation with signalto-noise ratios of 0.5, 1, and 2. In particular, the acquisition behavior for large initial frequency deviations is examined. It is apparent from the results that the loop is very effective in improving the acquisition range and times, even under noisy conditions. (Author)

AD-625 957 Fld. 9/5
CFSTI Prices: HC $2.00 MF $0.50
MICRO STATE ELECTRONICS CORP MURRAY HILL N J
ELECTRONICALLY TUNABLE YIG FILTERS WITH ELECTRONICALLY VARIABLE BANDWIDTH.
Technical rept.,
by Raoul Pettai. Nov 65, 50p. Contract AF30 (602)-3625 Proj. AF-5573 Task 557301
RADC TR-65-374
Unclassified report

Descriptors: (*Band-pass filters, Ferromagnetic materials), Yttrium compounds, Iron compounds, Garnet, Tuning devices, Bandwidth, Microwave equipment, S band, Resonators

The purpose of this work is to develop an electronically tunable YIG bandpass filter with electronically variable bandwidth. The center frequency is to vary from 2.0 to 4.0 Gc and the bandwidth from 5 Mc to 50 Mc independently of the center frequency. In this report a theoretical background is presented for the method of varying the bandwidth of a YIG filter by changing the angle between the dc biasing field H sub dc and the incident rf magnetic field h sub rf. The results are then used to analyze single and double-resonator YIG filters. Experimental results agree with the theory for a single-resonator circuit. A two-resonator YIG filter has thus far yielded a 3.2:1 change in bandwidth but at the expense of a 12 db insertion loss at the narrowest (5 Mc) bandwidth. The role of the coupling coefficient K between the YIG resonators is analyzed since the rapid increase of insertion loss and the failure to obtain larger changes in bandwidth is felt to be due to variations in K such that the product KQ sub e does not remain constant. Experimental results are presented for a two-resonator YIG filter using a number of differently shaped coupling apertures. (Author)

AD-625 958 Fld. 9/5, 20/7
CFSTI Prices: HC $1.00 MF $0.50
MARTIN CO ORLANDO FLA
MILLIMETER AND SUBMILLIMETER DEVICE RESEARCH.
Quarterly progress rept. no. 1, 1 Jul-1 Oct 65,
by J. J. Gallagher, and R. E. Cupp. Oct 65, 23p. Rept. no. OR-6791
Contract DA-28-043-AMC-01236 (E) Proj. DA-1P6-22001-A-058
Unclassified report

See also AD-601 918.

Descriptors: (*Millimeter waves, Molecular beams), (*Submillimeter waves, Molecular beams), (*Molecular beams, Excitation), (*Frequency, Standards), Electron transitions, Interferometers, Frequency stabilizers, Crystal oscillators, Control systems, Spectrum analyzers, Lithium compounds, Fluorides

Molecular beam investigations were continued with the Ramsey interferometers separated by 27 inches. This operation yields a linewidth as narrow as 350 cps. Broadening effects continue to be present. A description is given of a molecular beam apparatus which is being prepared for observations on lithium fluoride. Various experimental aspects of the molecular beam work and of millimeter techniques are discussed. (Author)

AD-625 987 Fld. 9/5
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
REPRESENTATION OF NONLINEAR NETWORKS,
by E. S. Kuh. 30 Sep 65, 9p. Rept. no. ERL-65-25
Contract NSF-GP-2684
Unclassified report

Availability: Proceedings of the National Electronics Conference v21 p702-7 1965.

Descriptors: (*Electrical networks, Mathematical models), Nonlinear systems, Topology, Graphics, Differential equations, Capacitors, Inductance, Resistors

The signal flow graph representation puts in evidence the two sets of equations which characterize a general nonlinear time varying network, the set specifying the network topology and the set describing the branch relations. Conditions for reduction of simple nonlinear signal flow graph are illustrated. To obtain the governing differential equation, one needs to reduce the signal flow graph. Obvious sufficient conditions in terms of the nonlinear branch relations and linear topology are immediately obtained.

AD-626 048 Fld. 9/5, 13/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
A PIEZOELECTRIC RESONATOR WITH A HEATING ELEMENT,
by P. G. Pozdnyakov, and E. G. Markosyan. Dec 65, 5p. Rept. no. FSTC-381-T65-594
TT 66-60177
Unclassified report

Trans. of Patent (USSR) 166 745, pub. in Byulleten Izobretenii i Tovarnykh Anakov (USSR) n23 1964.

Descriptors: (*Resonators, Piezoelectric effect), (*Heating elements, Resonators), USSR, Patents, Films, Electrodes, Heating, Surfaces

The subject of the invention is a piezoelectric resonator with a heating element deposited directly on the surface of the piezoelectric resonator. To uniformly heat the whole surface of the resonator, piezoelectric resonator electrodes made in the form of a ribbon spiral and divided by insulating grooves are used as a heating element. (Author)

AD-626 088 Fld. 9/5
CFSTI Prices: HC $3.00 MF $0.75
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
THE BACKFIRE HELICAL ANTENNA.
Technical memo.,
by Tobe L. Sexson. 23 Jun 65, 77p. Rept. no. EDL-M795
Contract DA-36-039-AMC-03404 (E)
Unclassified report

Descriptors: (*Helical antennas, Antenna radiation patterns), Propagation, Determinants, Electrical impedance, Scanning, Wave transmission, Measurement

When the diameter of the ground plane of a conventional helical antenna is reduced to the diameter of the helix, different radiation characteristics are observed. That is, for a small ground plane feed, the helix radiates with its main beam in the backfire direction when the pitch angle is small. When the pitch angle is large, however, the backfire beam splits and scans towards broadside as the frequency is increased. A theoretical solution for the propagation constants of the fields along the helix is discussed, and the results are displayed in the form of k-beta diagrams. The results of impedance, pattern, and current distribution measurements are presented and interpreted in terms of this diagram. (Author)

AD-626 177 Fld. 9/5
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB
SOME EXTREMAL PROPERTIES OF THE DOLPH ARRAY.
Physical sciences research papers,
by Charles J. Drane Jr.. Nov 65, 27p. Rept. no. PSRP-165
Proj. AF-4600 Task 460006
AFCRL 65-833
Unclassified report

Descriptors: (*Antenna arrays, Antenna radiation patterns), Numerical analysis, Beams (Electromagnetic), Antenna lobes, Gain, Scanning, Optimization

Approximate but accurate closed-form representations for directive gain and radiation pattern beamwidth were developed for the classical Dolph-Chebyshev design of an optimum, linear antenna array of uniformly placed isotropic elements. Both directivity and beamwidth are functions of the length of the array, as well as of the particular sidelobe level for a chosen design. This paper contains information regarding the value of the mainlobe/sidelobe ratio required to achieve maximum directivity values for a wide range of array lengths. Corresponding values of maximum directivity are also included. The directivity-beamwidth product is evaluated over a wide range of sidelobe levels and array lengths, and the region over which this product is essentially constant is specified. In the interests of achieving joint minimization of beamwidth and maximization of directivity, the particular value of sidelobe level - such that the directivity-beamwidth ratio is maximized - is determined. The nature of the effect of scanning on these studies is included. (Author)

AD-626 183 Fld. 9/5
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
STUDY OF CROSSED-FIELD AMPLIFIERS,
Quarterly progress rept. no. 8, 15 Apr-15 Jun 65,
by R. A. Rao, T. Van Duzer, and S. P. Yu. 15 Jun 65, 25p. Contract DA-36-039-AMC-02164 (E)
Proj. DA-3A99-13-001
Unclassified report

See also AD-622 689.

Descriptors: (*Crossed field devices, Microwave amplifiers), (*Microwave amplifiers, Crossed field devices), Electron guns, Noise (Radio), Magnetrons, Electron beams, Electromagnetic shielding, Backwavewave amplifiers, Space charges, Electrodes, Performance (Engineering)

An electron gun which produces a smooth transition from Kino flow near the drift region was designed using a new method of synthesis. An experimental gun was fabricated and tested. The agreement between theory and experiment was good. Noise-figure expressions were derived for cyclotron and space-charge wave amplifiers. These expressions are to be studied to determine the conditions for minimum noise-figure. A five-wave analysis was used to determine the wave amplitudes and phase factors resulting from the interaction between the circuit wave and the beam space-charge waves. The amplitudes of the significant waves were calculated as a junction of beam position for normal experimental conditions. Calculations show that beam-position fluctuation is the most important factor in the noise-figure. A theoretical analysis of crossed-field guns is being carried out to study the effect of a crossed magnetic field on potential minimum stability. A statistical analysis of the cut-off characteristics of the smooth-bore magnetron was completed. The theoretical results were shown to be in close agreement with existing experimental results. (Author)

AD-626 224 Fld. 9/5
CFSTI Prices: HC $3.00 MF $0.75
LINCOLN LAB MASS INST OF TECH LEXINGTON
DEVELOPMENT OF A LARGE DYNAMIC RANGE TUNNEL DIODE AMPLIFIER FOR PHASED ARRAY RECEIVERS.
Final rept. 1 Jan-30 Sep 65,
by A. Presser. 30 Sep 65, 84p. Contract AF19 (628)-500
ESD TDR-65-592
Unclassified report

Subcontracted to David Sarnoff Research Center, Princeton, N. J.

Descriptors: (*Microwave amplifiers, Tunnel diodes), (*Tunnel diodes, Microwave amplifiers), S band, Germanium, Gallium alloys, Arsenic alloys, Performance (Engineering), Bandwidth, Gain, Microwave equipment, Waveguide circulators, Antenna arrays

An investigation was made to develop large dynamic range S-band tunnel diode amplifiers for phased array receivers. The report covers a reproducibility study of these amplifiers, and the investigation of amplifier characteristics pertinent to phased array applications. Three two-stage tunnel diode amplifiers were delivered to Lincoln Laboratory. These amplifiers operate at a center frequency of 2.85Gc/s =2%, have a 1.5dB bandwidth ranging from 400-450 Mc/s at a gain of 18.0 to 18.5 dB, and have a noise figure between 5.6 and 5.9 dB. The amplifiers are unconditionally stable, and their output power at the 1 dB compression point ranges from - 10.5 dBm to - 12 dBm. The phases of any two amplifiers track within =3 degrees over a band of 110-190 Mc/s, and the amplitudes track within =1/2 dB over a Band of 290-410 Mc/s. (Author)

AD-626 269 Fld. 9/5
CFSTI Prices: HC $3.00 MF $0.75
POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST
SELECTED TOPICS IN MODERN NETWORK THEORY,
by Dante C. Youla. Oct 65, 87p. Rept. no. PIB-MRI-1258-65
Contract AF30 (602)-2868
RADC TR-65-259
Unclassified report

Descriptors: (*Electrical networks, Theory), Circuits, Functional analysis, Synthesis, Transducers, Power, Gain

This report is a research monograph which presents in depth a sample of many developments in network theory which have taken place within the last decade. Most of the preoccupation is with 1 and 2 part networks with the results inspired by the desire to build better linear filters. In particular known results on two variable positive real functions, inspired by a consideration of network building blocks of both lumped and distributed parameter type, is included. (Author)

AD-626 282 Fld. 9/5
CFSTI Prices: HC $4.00 MF $0.75
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
TECHNOLOGY AND ARMAMENT, 1965, NO. 1
13 Oct 65, 105p. Rept. no. ACSI-I-7592
TT 66-60230
Unclassified report

Trans. of Tekhnika i Vooruzhenie (USSR) n1 pp. 77, 92-5 1965.

Descriptors: (*Military publications, USSR), Military requirements, Arm forces operations, Military personnel, Tanks (Combat vehicles), Vertical take-off planes, Ships, Roll Stabilization, Gas discharges, Electron tubes, Earth-handling equipment, Acoustic equipment, Sound reproduction systems, Military training, Officer personnel, Teaching machines, Traffic, Control, Armed forces transportation, Maintenance, Automation, Electronic equipment, Communication equipment, Patents, Astronautics

Contents: Regulations and equipment; the country was clothed in armor; our guests, the staff of the combat annals of the urals; vertical take-off plane; roll arresters; ion tubes; trench diggers; duplex loud-speaker system; teaching machines help in teaching; automation of the search for malfunctions; a plan - our helper; diesels at low temperatures; use the patent library; competition continues; experience and initiative; pioneers of cosmonautics.

AD-626 321 Fld. 9/5
CFSTI Prices: HC $2.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
THE QUASI-STATIC FIELDS OF DIPOLE ANTENNAS. PART 1.
Research rept.,
by Peter R. Bannister. 3 Jan 66, 39p. Rept. no. USL-701
Proj. SF-106-01-02-7077
Unclassified report

Descriptors: (*Antenna radiation patterns, Dipole antennas), (*Dipole antennas, Field theory), Electric fields, Magnetic fields

The electric and magnetic field components produced by vertical and horizontal dipoles (both electric and magnetic types) are presented for the quasi-static range, absolute value (free space propagation constant x rho) $<< 1$, and $z = h = 0$. The special cases of absolute value (earth propagation constant x rho) > 1 or < 1, and a stratified lower half space (the earth) are examined in detail. (Author)

AD-626 324 Fld. 9/5, 17/3
CFSTI Prices: HC $2.00 MF $0.50
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
A DIGITAL SIMULATION OF THE WULLENWEBER DIRECTION FINDING SYSTEM.
Final technical rept.,
by Edwin C. Jones Jr.. Dec 65, 29p. Rept. no. RRL-296 ,TR-17
Contract NObsr-89229
Unclassified report

See also AD-417 243, AD-423 890.

Descriptors: (*Direction finding, Simulation), (*Antenna arrays, Simulation), Digital systems, Programming (Computers), Sampling, Radio signals, Dipole antennas

A description is given of a digital model for simulation of the Univ. of Illinois Wullenweber direction finding system when operating in the scanning mode. The Wullenweber array is a circular array of 120 vertical monopoles located on the periphery of a circle about 303 meters (994 feet) in diameter. The programmed digital model uses as input the azimuth, elevation angle and frequency of an assumed incoming signal, and from this determines the amplitude and phase response of the 60 anten-

nas illuminateed by that parrticular signal; the remaining 60 responses are set to zero. The result of scanning is a set of numbers representing the real and quadrature axis of the scanner output of each scanning point within the sector sampled. The remaining sampling points have negligible outputs and are set to zero. A number of samples per revolution is chosen that will allow 12 or more significant samples to be retained before the bearing is computed. By the sample rejection scheme, (1) the maximum sample and its location may be determined and (2) the maximum error may be kept to less than 1 degree in bearing over the 4.0 to 12.0 mhz frequency range.

AD-626 327 Fld. 9/5, 9/1
CFSTI Prices: HC $2.00 MF $0.50
SYRACUSE UNIV N Y DEPT OF ELECTRICAL ENGINEERING
INPUT VSWR MINIMIZATION FOR A TRANSMISSION LINE WITH MULTIPLE DISCONTINUITIES.
Task rept. no. 11,
by James G. Rudolph, and David K. Cheng. Dec 65, 31p. Rept. no. EE-957-6504T11
Contract AF30 (602)-2646 Proj. AF-4506 Task 450604
RADC TR-65-171
Unclassified report

See also AD-618 035.

Descriptors: (*Transmission lines, Standing wave ratios), (*Standing wave ratios, Transmission lines), (*Phase distortion, Transmission lines), Radar antennas, Radar scanning, Antenna arrays, Numerical analysis

A technique using an isometric-circle interpretation of a bilinear transformation has been developed for minimizing the input VSWR of a transmission line consisting of multiple discontinuities joined by line sections. It makes possible the determination not only of the minimum attainable input VSWR but also of the required line lengths between the successive discontinuities. The case for N real and equal discontinuities is particularly simple, and the necessary conditions for obtaining a perfect match are established. Numerical examples are given. (Author)

AD-626 372 Fld. 9/5, 13/10
CFSTI Prices: HC $2.00 MF $0.50
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD
A CONSTANT-FREQUENCY POWER SUPPLY FOR SHIPBOARD ELECTRIC CLOCKS,
by P. B. Perry, and S. H. Lebowitz. Jan 66, 41p. Rept. no. MEL-404/65
Proj. S-F013-15-04 Task 10981
Unclassified report

Descriptors: (*Clocks, Power supplies), (*Power supplies, Frequency stabilizers), Shipborne, Inverter circuits, Synchronization (Electronics), Frequency dividers, Transistors

The replacement of spring-powered clocks with synchronous motor-driven electric clocks in shipboard control spaces produced a problem of inaccurate timekeeping due to the poor frequency stability of shipboard power systems. To alleviate this problem, a low-cost solid-state, tuning-fork controlled static inverter-type power supply, capable of powering up to six internally illuminated clocks per MIL-C-23339, with timekeeping accuracy better than =15 seconds per day (and suitable for shipboard use) was developed. The development, design, construction, and testing to requirements of MIL-I-983C of a development model of this power supply are described. It is recommended that units of this type be procured for installation in control spaces of ships equipped with electric clocks. (Author)

AD-626 450 Fld. 9/5, 12/2
CFSTI Prices: HC $3.00 MF $0.75
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
I. SERVOMECHANISMS THEORY. A FAMILIARIZATION COURSE.
May 58, 68p. Rept. no. TG-288-1
Contract NOrd-7386
Unclassified report

Descriptors: (*Servomechanisms, Theory), (*Training, Servomechanisms), Stability, Control systems, Guided missile components, Integral transforms, Graphics, Functions

This report documents the first of a series of Familiarization COourses sponsored by the Applied Physics Laboratory Committee on Education. The aim of the series is the instruction of staff members in operations and techniques outside their own areas of specialization leading to a ready integration of ideas between fields and to the establishment of sound bases for further inquiry. A class numbering 36 was in attendance at the talks given by members of the Laboratory's Bumblebee Controls Group during July and August of 1957. Bumblebee Missile Control Systems by W. A. Good; Laplace and Fourier Transforms and Their Uses by J. M. LeGare; Graphical Representation of Transfer Functions by R. J. Martin; and Stability and Compensation by B. E. Amsler.

AD-626 490 Fld. 9/5
OKLAHOMA UNIV RESEARCH INST NORMAN
SQUARE WAVE CURRENT SHAPING DEVICE FOR ZEEMAN-MODULATION SOLENOID.
by Donald R. Johnson, Edgar A. Rinehart, and Chun C. Lin. 7 Jul 65, 3p. Rept. no. TR-15
Contract Nonr-982 (07) Proj. NR-014-109
Unclassified report

Availability: Published in The Review of Scientific Instruments v36 n11 p1666-7 Nov 1965. Copies to DDC users only.

Descriptors: (*Waveform generators, Microwave spectroscopy), Solenoids, Modulators

AD-626 566 Fld. 9/5, 12/1
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C
MULTIVARIABLE SYSTEMS,
by Bernard S. Morgan,Jr.. 1965, 11p. Rept. no. AFOSR-65-1978
Proj. AF-9749 Task 974901
Unclassified report

Availability: Published in IEEE International Convention Record pt 6 p87-95 1965. Copies to DDC users only.

Descriptors: (*Control systems, Automatic), Automata, Servomechanisms, Feedback, Multiple operation, Optimization

What to do with the coupling or interaction as it exists in multivariable systems is discussed. In a discussion of descriptions of multivariable systems, emphasis is placed on the influence that the design of multivariable systems has had on the theory of dynamical systems. Discussed briefly is the future influence of automata theory on multivariable systems. Reported in detail are design techniques for noninteracting systems and for improvement of performance by use of interaction. Under applications a discussion of design techniques used in practical multivariable systems is presented. (Author)

AD-625 678 See Fld. 9/3

AD-625 778 See Fld. 14/2

AD-625 892 See Fld. 20/6

AD-625 975 See Fld. 20/6

AD-626 024 See Fld. 6/3

AD-626 326 See Fld. 9/1

AD-626 592 See Fld. 17/9

9/6. TELEMETRY

AD-626 241 See Fld. 9/4

10/1. CONVERSION TECHNIQUES

AD-625 792 Fld. 10/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CONTACTLESS METHOD OF MEASURING AMPLITUDE AND FREQUENCY OF VIBRATIONS OF BLADES OF REVOLVING TURBINES, FOR EXAMPLE, GAS ONES,
by N. A. Yashkir. 19 Oct 65, 6p. Rept. no. FTD-TT-65-1012
TT 66-60140
Unclassified report

Unedited rough draft trans. of patent (USSR) 164 968, appl. no. 827523/26-10, 28 Mar 63, 2p.

Descriptors; (*Turbine blades, Vibration), Infrared radiation, Rotation, Frequency, Photoelectric effect, Patents, USSR, Measurement, Gas turbines

The object of the invention is a contactless method of measuring the amplitude and frequency of the vibrations of the blades of a revolving turbine, for example, of a gas one, with the use of photoelectric pickups. Use is made of the infrared rays given off by the highly heated parts of the turbine blades. In the body of the turbine openings are made through which the flux of rays with the aid of an optical system and an optical wedge with a density changing directly proportionally in length, is projected onto the photosensitive element of the pickup the signal on the output of which is proportional to the parameters to be measured. (Author)

AD-625 902 See Fld. 20/13

AD-625 903 See Fld. 20/13

10/2. POWER SOURCES

AD-626 140 Fld. 10/2, 1/3
CFSTI PricesMF $1.00
LEAR SIEGLER INC CLEVELAND OHIO POWER EQUIPMENT DIV
400 CPS VARIABLE SPEED GENERATOR SYSTEM. VOLUME I.
Final rept., vol. 1.
15 Dec 64, 138p. Rept. no. Lear Siegler-51907-Vol-1
Contract AF33 (657)-7999
Unclassified report

See also AD-626 141.

Descriptors: (*Electric power production, Aircraft equipment), (*Generators, Frequency converters), (*Frequency converters, Generators), Alternating current, Control systems, Voltage regulators, Stability, Performance (Engineering), Signal generators, Air cooled, Gears, Silicon controlled rectifiers, Circuits

AD-626 141 Fld. 10/2, 1/3
CFSTI PricesMF $1.25
LEAR SIEGLER INC CLEVELAND OHIO POWER EQUIPMENT DIV
400 CPS VARIABLE SPEED GENERATOR SYSTEM. VOLUME II.
Final rept., vol. 2.
15 Dec 64, 213p. Rept. no. Lear Siegler-51907-Vol-2
Contract AF33 (657)-7999
Unclassified report

See also AD-626 140.

Descriptors: (*Electric power production, Aircraft equipment), (*Generators, Frequency converters), (*Frequency converters, Generators), Alternating current, Control systems, Transformers, Noise (Radio), Circuits, Performance (Engineering), Specifications, Silicon controlled rectifiers, Gears, Voltage regulators

AD-626 142 Fld. 10/2, 1/3
CFSTI PricesMF $1.25
LEAR SIEGLER INC CLEVELAND OHIO POWER EQUIPMENT DIV
400 CPS VARIABLE SPEED GENERATOR SYSTEM. VOLUME III.
Final rept., vol. 3.
15 Dec 64, 199p. Rept. no. Lear Siegler-51907-Vol-3
Contract AF33 (657)-7999
Unclassified report

See also AD-626 141.

Descriptors: (*Electric power production, Aircraft equipment), (*Generators, Frequency converters), (*Frequency converters, Generators), Alternating current, Control systems, Systems engineering, Signal generators, Gears, Voltage regulators, Silicon controlled rectifiers, Circuits, Noise (Radio), Electric filters, Performance (Engineering)

AD-626 420 Fld. 10/2, 7/4, 7/3
CFSTI Prices: HC $4.00 MF $0.75
TYCO LABS INC WALTHAM MASS
ELECTROCHEMICAL OXIDATION OF SATURATED HYDROCARBONS.
Interim technical rept. no. 4, 1 Apr-31 Oct 65,
by S. B. Brummer, and J. Giner. 31 Oct 65, 108p.
Contract DA-44-009-AMC-410 (T)
Unclassified report

See also AD-610 265.

Descriptors: (*Fuel cells, Electrochemistry), (*Hydrocarbons, Oxidation), (*Alkanes, Oxidation), (*Propanes, Oxidation), Electrodes, Adsorption, Diffusion, Catalysts, Sodium compounds, Borohydrides, Methanols, Corrosion, Phosphoric acid, Tantalum alloys, Surface properties, Crystal lattice defects

The work was concerned with the practical implementation of the hot concentrated phosphoric acid, direct oxidation, hydrocarbon fuel cell. Experiments were concerned with three aspects of the over-all problem: the mechanism of the hydrocarbon to carbon dioxide reaction on a platinum anode, the role of surface morphology and surface defect structure in optimizing the characteristics of dispersed platinum-metal catalysts, and the development of suitable corrosion resistant structural materials for use in the acid electrolyte. The mechanism study was concerned with an investigation of the oxidative adsorption of propane on smooth platinum. Both the surface morphology study and the corrosion program were initiated.

AD-626 434 Fld. 10/2
CFSTI Prices: HC $3.00 MF $0.75
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN
SILENT, LIQUID HYDROCARBON-AIR FUEL CELL POWERPLANT. VOLUME I. TEXT.
Interim technical rept. 18 Mar-18 Sep 65,
by Stephen J. Keating,Jr.. 8 Oct 65, 82p. Rept. no. PWA-2678-Vol-1
Contract DA-44-009-AMC-967 (T)
Unclassified report

Descriptors: (*Fuel cells, Power supplies), (*Power supplies, Fuel cells), (*Ground support equipment, Fuel cells), Gas generators, Performance (Engineering), Design, Pumps

A preliminary reference design system consisting of a fuel cell module and a hydrogen generator was established and used to determine overall powerplant weight, volume and thermal efficiency. These are 410 lbs, 15 cu ft and 35.6% respectively. The reference design system also established the basic component characteristics from which system transient response capability may be determined during the next pahse of the contract. Other studies were conducted to establish optimum system characteristics and operating parameters. The effects of reformer temperature, pressure and water-to-fuel ratio were studied. The effect of high altitude and ambient temperature and humidity on powerplant weight size and efficiency and on water recovery were analyzed and a start-up procedcure established. (Author)

AD-626 435 Fld. 10/2
CFSTI Prices: HC $3.00 MF $0.75
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN
SILENT, LIQUID HYDROCARBON-AIR FUEL CELL POWERPLANT. VOLUME II. FIGURES AND TABLES.
Interim technical rept. 18 Mar-18 Sep 65,
by Stephen J. Keating,Jr.. 8 Oct 65, 91p. Rept. no. pwa-2678-Vol-2
Contract DA-44-009-AMC-967 (T)
Unclassified report

Descriptors: (*Fuel cells, Power supplies), (*Power supplies, Fuel cells), (*Ground support equipment, Fuel cells), Tables

AD-626 444 Fld. 10/2
CFSTI Prices: HC $4.00 MF $0.75
RADIO CORP OF AMERICA LANCASTER PA DIRECT ENERGY CONVERSION DEPT
THE DEVELOPMENT OF A LOW-WORK-FUNCTION COLLECTOR FOR THERMIONIC ENERGY CONVERTERS.
Annual technical summary rept. no. 3, 1 Nov 6430 Oct 65,
by P. K. Shefsiek, and R. J. Buzzard. 30 Oct 65, 121p. Contract Nonr-4012 (00)-FBM
Unclassified report

See also AD-609 913.

Descriptors: (*Power equipment, Energy conversion), (*Thermionic converters, Work functions), (*Work functions, Thermionic converters), Performance (Engineering), Mathematical analysis

The report covers the full year's work toward the improvement of thermionic energy conversion. This work can be divided into two separate tasks which were concerned respectively with the analysis of special materials to enhance low work function in collector electrodes and the development of a mathematical equation to describe converter performance in terms of physical parameters and conditions. The analysis of materials verified prior work that matrix surfaces delivered improved performance over other electrode surfaces. Of the materials evaluated during the report period, tantalum was superior to tungsten, molybdenum and iridium while nickel was inferior to the three median matrices. The mathematical equation relates output potential to the other parameters of current density, emitter temperature, collector temperature, cesium temperature and electrode spacing. The functional relationships of the converter parameters used in the equations are based on the general theoretical model of thermionic converter operation. The coefficients assigned to each term of the equation are determined by application of linear regression statistical analysis to measured voltage current data. The analysis has been applied to data from several different electrode pairs from different laboratories with excellent correlation with measured data over a wide variation in parameters. (Author)

AD-626 593 Fld. 10/2, 11/6
CFSTI Prices: HC $3.00 MF $0.75
MARTIN CO MIDDLE RIVER MD NUCLEAR DIV
INVESTIGATIONS USING SEGMENTED COLLECTOR THERMIONIC CONVERTERS.
Yearly technical summary rept. 1 Jan-15 Dec 65,
by James D. Long, and John Psarouthakis. 15 Jan 66, 78p. Rept. no. MND-3247
Contract Nonr-3639 (00) Proj. NR-099-363
Unclassified report

See also AD-608 554.

Descriptors: (*Thermionic converters, Refractory metals), (*Refractory metals, Thermionic emission), Energy conversion, Diodes, Anodes (Electron tubes), Plasma medium, Surface properties, Niobium, Ruthenium, Molybdenum, Rhenium, Flame spraying, Materials forming, Degasification, Work functions, Oxygen, Design, Mechanical drawings, Manufacturing methods

A total of five different collectors were investigated as collector materials in thermionic test converters each incorporating segmented collectors for simultaneous testing within the same environment. The metals tested were niobium, oxygenated niobium, plasma-sprayed ruthenium, molybdenum and rhenium. One ruthenium collector surface was used in each diode to permit intercomparison of the two converters. Both converters used a single plasmasprayed Ru emitter which was common to the three collectors. Ruthenium, niobium and oxygenated niobium were tested in the first converter. The collector work functions varied within about 0.1 ev from one substrate material to another, with minimum values at low as 1.1 ev. It is probable that the oxygen present in the oxygenated niobium either migrated to the other collector surfaces or evaporated and was subsequently absorbed by the other surfaces. The adsorbed oxygen and cesium vapors probably formed CsO_2 and Cs-vapor layers on the substrate, thus bring about the low work functions. Molybdenum, rhenium and rruthenium were tested in the second converter. This converter did not incorporate any purposely oxygenated surfaces. The work functions obtained from these metals with adsorbed cesium were higher than those under the pressure of oxygen as expected. (Author)

AD-626 261 **See Fld. 14/2**

10/3. ENERGY STORAGE

AD-625 693 Fld. 10/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
THE PLATE MATERIALS OF THE LEAD-ACID CELL. PART 1. ANODIC OXIDATION OF THE BASIC SULFATES OF LEAD.
Final rept.,
by Jeanne Burbank. 23 Nov 65, 17p. Rept. no. NRL-6345
Proj. SF-013-06-06-4366 ,RR-001-01-43-4755
Unclassified report

Descriptors: (*Batteries + components, Electrodes), (*Lead compounds, Sulfates), Storage batteries, Oxidation, Oxides, Crystals, Electron microscopy, Anodes (Electrolytic cell), X-ray diffraction analysis

The basic lead sulfates $PbO \cdot PbSO_4$, $3PbO \cdot PbSO_4 \cdot H_2O$, and $4PbO \cdot PbSO_4$ were prepared by reacting PbO and dilute H_2SO_4. The crystalline phases were identified by x-ray diffraction patterns, and electron microscope examination showed all three to be prismatic needles. The three basic sulfates were oxidized anodically in dilute H_2SO_4, and x-ray diffraction showed that each transformed to beta-PbO_2. The pellet made from $4PbO \cdot PbSO_4$ was mechanically strong, and the transformation to PbO_2 was largely metasomatic after the original crystals of the basic sulfate. The

three anodic preparations were examined in the electron microscope and showed the presence of prismatic and nodular particles of PbO2. (Author)

AD-626 229 Fld. 10/3, 7/2, 7/4
DEFENCE RESEARCH BOARD OTTAWA (ONTARIO)
STUDIES ON THE STABILITY OF OXIDES OF SILVER,
by G. D. Nagy, W. J. Moroz, and E. J. Casey.
1964, 7p.
DCBRL 460
Unclassified report

Prepared for presentation at the Annual Power Sources Conference (19th), Atlantic City, N. J. May 18-20 1965.

Availability: Published in Proceedings of the Annual Power Sources Conference (19th) 1965. Copies to DDC users only.

Descriptors: (*Storage batteries, Catalysts), (*Silver compounds, Stability), Oxides, Pyrolysis, Chemical analysis, Synthesis (Chemistry), Oxidation-Reduction reactions

The goal of the work was a better understanding of the mechanism of thermal decomposition of silver oxides themselves, i.e. without stabilizing ligands. A start was made on a method of characterizing chemically-prepared AgO, both from the theoretical and experimental standpoints. Some new information is reported on preparation and properties of anodically formed wet 'Ag2O3.'

11/1. ADHESIVES AND SEALS

AD-626 049 Fld. 11/1, 13/8
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
MEANS OF LOWERING THE CURING TEMPERATURE OF HEATPROOF ORGANO-SILICON ADHESIVES,
by A. B. Davydov, and Z. G. Ivanova. Dec 65, 10p. Rept. no. FSTC-381-T65-607
TT 66-60178
Unclassified report

Trans. from Plasticheskie Massy (USSR) n4 1965.

Descriptors: (*Aging (Materials), Adhesives), (*Adhesives, Aging (Materials), (*Silicone plastics, Adhesives), Heatresistant plastics, Bonded joints, Catalysts, Organic compounds, USSR, Glass, Silanes, Potassium compounds, Acetates, Shear stresses, Thermal properties

It was established that additions of pulverized glass to the VK-2 adhesives do not occasion any reduction in its curing temperature. The introduction of glass into the '588' composition in a quantity of 3% (dry weight) reduces the adhesives' curing temperature of 200C, providing the bonded joints a strength which is practically equal to their strength under optimum bonding conditions. A comparison of the results of the application of the above innumerated catalysts shows that the curing temperature can be reduced to 200-220C only with the introduction of Product 18 and potassium acetate into the VK-2 adhesive. A reduction of the curing temperature of the composition 588 down to 200-220C can be effected by all investigated additions. The data in Table 2 show that additions of the most active catalyzing components (Product 18, CH3 COOK, silica glass powder) to the VK-2 and 588 compositions do not occasion a negative effect on the thermal stability of the bonded joints. Observation of the changes in the properties of adhesive composition with additions of catalysts showed that TES and silica glass do not have any effect on the stability of the adhesive composition properties during their storage. Additions of Product 18 and potassium acetate have a catalyzing effect on the composition's 'aging' process; therefore they should be introduced directly before using the adhesive.

AD-625 809 See Fld. 7/3

11/2. CERAMICS, REFRACTORIES, AND GLASSES

AD-626 580 Fld. 11/2, 1/5, 20/11
CFSTI PricesMF $0.75
OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB
THE DYNAMIC LOADING OF CONCRETE TEST SLABS.
Final rept. on Wright Field Slab Tests.
Aug 43, 58p.
Unclassified report

Availability: Ohio River Div. Labs., Mariemont, Ohio. HC$1.00 CFSTI MF$0.75.

Descriptors: (*Concrete, Loading (Mechanics)), (*Loading (Mechanics), Concrete), (*Runways, Impact tests), Strain (Mechanics), Statics, Dynamics, Experimental data

The purpose of this investigation is to compare the effect of impact loads produced by the landing of heavy airplanes and equivalent static loads on concrete runways. For the severest probable landings the load factor cannot exceed 2.0, and for normal landings the load factor is less than 1.0 for planes having a gross weight of 14,500 lbs. or more. For impact loads of the type a plane exerts upon landing the resulting stresses do not exceed those which would result from an equivalent static load. (Author)

AD-625 786 See Fld. 20/2

AD-626 206 See Fld. 18/8

AD-626 474 See Fld. 18/8

11/3. COATINGS, COLORANTS, AND FINISHES

AD-625 800 Fld. 11/3, 11/6
CFSTI Prices: HC $4.00 MF $1.00
ARIZONA UNIV TUCSON ENGINEERING RESEARCH LABS
PLASMA-JET COATING OF TUNGSTEN ON STEEL.
Final rept. 6 Feb 61-30 Apr 62,
by Richard L. Landingham, Robert A. Damon, and Daniel J. Murphy. 30 Apr 62, 137p. Contract N123 (60530)24981A
Unclassified report

Descriptors: (*Tungsten, Metal coatings), (*Steel, Refractory coatings), (*Plasma jets, Metal coatings), (*Metal coatings, Plasma jets), Bonding, Sprays, Surface properties, Iron, Substrates, Heat treatment, Stress relieving, Diffusion

Three methods for bonding plasma-jet sprayed tungsten to steel were developed and evaluated in an approach to the problem of providing heat-resistant materials for the design and fabrication of components for high temperature applications. Three types of coating were sprayed by plasma-jet on 1020 steel substrates: (1) an all tungsten coating, (2) a coating graded from 1020 steel at the interface to tungsten at the outer surface, and (3) a coating graded from iron at the interface to tungsten at the outer surface. By the latter two coating methods, a less severe thermal expansion gradient was developed between the substrate and the coating. Pre-heating the substrates increased the fusion bond at the interface. Post-heat treatments eliminated residual stresses within the coating and promoted grain growth and diffusion across the fusion zone. The tungsten-iron graded coating on the 1020 steel substrate displayed excellent resistance to shock and withstood high temperature corrosion conditions 2 1/2 times longer than uncoated substrates. The investigation emphasized the potential of the plasma-jet gun in providing a means for depositing a protective coating on a metallic substrate. (Author)

AD-626 213 Fld. 11/3, 11/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
PROTECTIVE COATINGS FOR MAGNESIUM ALLOYS. PART 2. RESISTANCE OF FLAME-FUSED TEFLONCOATED MAGNESIUM AND ALUMINUM ALLOYS TO CORROSION BY 3% SODIUM CHLORIDE SOLUTIONS.
Interim rept.,
by D. L. Venezky, A. G. Sands, and E. B. Simmons,Jr.. 15 Dec 65, 35p. Rept. no. NRL-6353
Proj. RRMA-03-073/652-1/F020-03-01
Unclassified report

Descriptors: (*Corrosion inhibition, Plastic coatings), (*Magnesium alloys, Corrosion inhibition), (*Aluminum alloys, Corrosion inhibition), (*Halocarbon plastics, Corrosion inhibition), Sodium compounds, Chlorides, Solutions, Corrosion resistance, Flame spraying, Environmental tests, Liquid immersion tests, Salt spray tests, Aging (Materials)

Teflon one-coat green enamel, which has been applied in thin films, 0.0002 to 0.0004 in. thick, and which has been properly flame fused, will not be wet by the 3% sodium chloride solution during the test period; specimens having such Teflon coatings exhibit enhanced corrosion resistance. Three methods were evaluated as accelerated corrosion tests: an immersion test, a salt droplet test, and a spherical-joint contact test which could be modified to measure the relative resistance of the coated specimens. Magnesium alloy AZ31B-H24, chrome pickled, was most resistant to corrosion when coated with flamefused Teflon one-coat green enamel; magnesium alloy specimens treated otherwise exhibited enhanced corrosion rates. Aluminum alloy 6061-T6, Teflon coated and flame fused, exhibited the greatest corrosion resistance when compared with the other aluminum alloys tested. No correlation was found between the various aluminum alloy tempers studied and the corrosion rate. In general, the corrosion tests indicate that the flame-fused Teflon coating afforded some protection against corrosion as compared to the uncoated specimens.

AD-626 432 Fld. 11/3
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
CATHODIC POLARIZATION OF SPENT ZINC-CONTAINING PAINTS IN SEA WATER,
by A. G. Khanlarova, M. R. Khanmamedova, and M. A. Ibrahimova. May 65, 9p. Rept. no. T-424-R
TT 66-60238
Unclassified report

Trans. of Lakokrasochnye Materialy i Ihk Primenenie (USSR) n3 p34-7 1964.

Descriptors: (*Paints, Zinc coatings), (*Zinc coatings, Cathodic protection), Polarization, Electrochemistry, Corrosion inhibition, Sea water, Binders, Styrene plastics, Rubber, USSR

It is shown that cathodic polarization of a spent zinc paint coating effects a restoration of its protective potential. The displacement of the potentials of the spent zinc coating in the negative direction depends on the chemical composition and the amount of insoluble zinc corrosion products, and also on the amount of zinc formed by the electrolysis of the water-soluble corrosion products of zinc (ZnCl2, ZnSO4). The use of cathodic protection simultaneously with protective coatings of zinc paint for the preservation of steel structures, marine petroleum equipment and ships makes possible a reduced expenditure of electric current and an

increase in the period of effectiveness of the paint coatings.

11/4. COMPOSITE MATERIALS

AD-625 851 See Fld. 13/10

AD-626 066 See Fld. 13/8

11/5. FIBERS AND TEXTILES

AD-626 150 See Fld. 1/5

11/6. METALLURGY AND METALLOGRAPHY

AD-625 781 Fld. 11/6, 13/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
OBTAINMENT OF DISPERSION METAL POWDERS BY ELECTRO REDUCTION OF DIFFICULT SOLUBLE COMPOUNDS IN MOLTEN MEDIA,
by I. P. Chernobaev, L. N. Antipin, and M. O. Loshkarov. 28 Sep 65, 12p. Rept. no. FTD-TT-65-904
TT 66-60133

Unclassified report

Unedited rough draft trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n5 p618-23 1963.

Descriptors: (*Powder metals, Production), (*Refining (Metallurgy), Powder metals), Ores (Metal sources), Electrolysis, Reduction (Chemistry), Molybdenum, Vanadium, Chromium, Cobalt, Nickel, Titanium, Electrolytes, Oxides, Crystal structure, Cermets

The possibility of obtaining metal powders of Co, Ni, Fe, Mo, V, and others from difficultly reducible oxides with the aid of intermediate reagents in molten electrolyte, is shown. The dependence of current output upon temperature and current density during the reduction of iron oxides is explained. It was established that the powders so obtained have, basically, a dendritic form and that the dimensions of the particles are in the range of 10-30 microns, thus making them suitable for the manufacture of ceramet objects. (Author)

AD-625 829 Fld. 11/6, 20/2
CFSTI Prices: HC $1.00 MF $0.50
FLORIDA UNIV GAINESVILLE METALLURGICAL RESEARCH LAB
X-RAY STUDY OF THE K-STATE IN METALLIC SOLID SOLUTIONS.
Final rept. 19 Oct 62-18 Oct 65,
by Albert G. Guy. 8 Dec 65, 10p. Contract DA-31-124-ARO (D)-51

Unclassified report

Descriptors: (*Metallic crystals, Solid solutions), (*Phase studies, X-ray diffraction analysis), Nickel alloys, Aluminum alloys, Resistance (Electrical)

The following important results were obtained in the investigation of the K-effect in nickel-aluminum alloys. Nickel-aluminum alloys containing 8.2 and 11.3 at. % Al were treated to produce the 'K-state' in various degrees and were then studied using x-ray scattering, smallangle scattering, electrical resistivity and electron microscopy. The results were interpreted as showing that the K-state phenomena can be attributed to different structural states in the two alloys studied. In the 8.2 at . % Al alloy, representative of compositions in the solid-solution region, the anomalous increase in resistivity indicative of the K-state was attributed only to short-range order. In the 11.3 at . % alloy, which lies in the two phase region of the equilibrium diagram, this K-state phenomenon was attributed primarily to GuinierPreston zones and secondarily to short-range order. Thus, an important property characterizing the K-state, the increase in electrical resistivity, was found to be caused by two different structural changes.

AD-625 876 Fld. 11/6, 20/12
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING
THE P-T-X PHASE DIAGRAM OF THE SYSTEM ZINCTELLURIUM.
by F. A. Kroger. 29 Mar 65, 3p. Contract AF-AFOSR-496-65
AFOSR 65-2399

Unclassified report

Availability: Published in Journal of Physical Chemistry v69 n10 p3367-9 Oct 1965. Copies to DDC users only.

Descriptors: (*Zinc alloys, Tellurium alloys), (*Tellurium alloys, Zinc alloys), Semiconductors, Thermodynamics, Pressure, Temperature, Phase studies

Combination of the results of thermodynamic and phase diagram studies with those of a physicochemical investigation of the semiconductor properties of ZnTe makes it possible to construct the pressure-temperaturecomposition (P-T-x) phase diagram of the system Zn-Te. (Author)

AD-625 900 Fld. 11/6, 13/8
CFSTI Prices: HC $1.00 MF $0.50
PACIFIC DIV BUREAU OF YARDS AND DOCKS PEARL HARBOR HAWAII
THE OCCURRENCE AND PREVENTION OF CORROSION,
by Willard E. Edwards. Dec 65, 11p.

Unclassified report

Descriptors: (*Corrosion, Steel), (*Steel, Corrosion inhibition), (*Cathodic protection, Steel), Magnesium, Coatings, Non-metals, Maintenance, Anodes (Electrolytic cell)

The best time to provide protection against corrosion is during the planning, design, and construction stages. This is done through the proper choice of both materials and construction methods. Coatings and cathodic protection of steel may then be called for and used as required. After that, rigid maintenance practices, regularly performed by qualified personnel, are essential in order to realize the great savings which can be accomplished through corrosion mitigation. Whenever underground leaks occur in iron or steel pipes due to external corrosion, it is good insurance to install a magnesium anode at the same time that the leak is repaired. Cathodic protection will usually save many times its installation cost wherever it may be required in corrosive soils or water.

AD-625 912 Fld. 11/6, 20/11, 20/12
CFSTI Prices: HC $3.00 MF $0.50
HENRY KRUMB SCHOOL OF MINES COLUMBIA UNIV NEW YORK
ANELASTIC TECHNIQUES: IRON, A CASE HISTORY.
Technical rept.,
by Daniel N. Beshers. 1965, 55p. Rept. no. TR-7
Contract Nonr-266 (61) Proj. NR-031-612 ,RR-007-01-01

Unclassified report

Descriptors: (*Internal friction, Iron), (*Iron, Internal friction), Damping, Crystal lattice defects, Temperature, Radiation damage, Metallography

Internal friction is defined and discussed rather generally. To illustrate the applicability of the method, the numerous phenomena observed in iron are reviewed. The results of recent low temperature experiments are compared, leading to suggested correlations among the observations. (Author)

AD-625 967 Fld. 11/6, 20/2
JOHNS HOPKINS UNIV BALTIMORE MD
GENERALIZED LARGE DEFORMATION BEHAVIOUR FOR FACE-CENTERED CUBIC SOLIDS: NICKEL, ALUMINUM, GOLD, SILVER, AND LEAD.
Revised ed.,
by James F. Bell. 29 Dec 64, 22p. Contract AF49 (638)-1067
AFOSR 65-1738

Unclassified report

Revision of manuscript submitted 4 Aug 64.

Availability: Published in Philosophical Magazine v11 n114 p1135-56 Jun 1965. Copies to DDC users only.

Descriptors: (*Metallic crystals, Deformation), (*Deformation, Metallic crystals), Single crystals, Hardening, Stresses, Strain (Mechanics), Shear stresses, Temperature, Impurities, Crystal lattices, Aluminum, Nickle, Gold, Silver, Lead, Copper

The stage III deformation of 318 single crystal tests of 40 expeerimentalists in aluminum, nickel, gold, silver, lead and copper is quantitatively compared, through the Taylor aggregate theory, with the present writer's generalized linearly temperature-dependent stressstrain law for completely annealed polycrystals earlier determined by the writer from the measurement of dynamic plastic strain by means of diffraction gratings. From calculations dependent upon a knowledge of stage II parameters, and from independent direct stage III calculations, the single crystal deformation of these six f.c.c. metals is found to be in close agreement with prediction. This parabolic linearly temperature dependent stage III deformation of the single crystals of these six f.c.c. metals is found to be independent of purity, of strain rate, of type of test (i.e. tension or compression) and of initial orientation when the resolved shear strain is calculated for single slip. The universal constant, beta sub 0 = 58.0 Kg/mm-sq, from the polycrystalline deformation is found to be determinable from the single crystal tests of all six metals at temperatures varying from 4.2 K to 1173 K, with single crystal parabolas grouped according to lattice spacing and atomic volume. (Author)

AD-625 968 Fld. 11/6, 20/2
JOHNS HOPKINS UNIV BALTIMORE MD
A GENERALIZED LARGE DEFORMATION BEHAVIOUR FOR FACE-CENTERED CUBIC SOLIDS-HIGH PURITY COPPER)
Revised ed.,
by James F. Bell. 23 Mar 64, 20p. Contract AF49 (638)-1067
AFOSR 65-1739

Unclassified report

Revision of manuscript submitted 21 Jan 64.

Availability: Published in Philosophical Magazine v10 n103 p107-26 Jul 1964. Copies to DDC users only.

Descriptors: (*Metallic crystals, Deformation), (*Deformation, Copper), Single crystals, Hardening, Temperature, Stresses, Strain (Mechanics), Compressive properties, Tensile properties, Mechanical waves, Symmetry (Crystallography)

The stage III deformation of high purity copper single crystals of initially single slip orientations is found, through the Taylor aggregate theory, to be in close qualitative and quantitative agreement with Bell's generalized, temperature-dependent, dead anneealed face-centered cubic polycrystalline stress-strain law. Parabolic stage III deformation is shown to be determinable from stage II measurement for all orientations. Thus, in dead annealed face-centered cubic polycrystals the wave speeds and strain of large amplitude plastic compression waves (which had been obtained from diffraction grating measurements) are gov-

ermed by a constitutive relation whose origin is in the stage III deformation of face-centered cubic single crystals. The 49 high purity copper single crystal tension tests examined are found to have the same stage III parabola in the data of the several investigators. The stage III deformation, whose parabola coefficient is dependent upon the temperature of the test and the melting point of the metal is shown to be independent of the length of stage I and stage II deformation. (Author)

AD-626 013 Fld. 11/6
CFSTI Prices: HC $2.00 MF $0.50
PITMAN-DUNN RESEARCH LABS FRANKFORD ARSENAL PHILADELPHIA PA
STRESS-CORROSION SUSCEPTIBILITY OF ULTRAHIGH STRENGTH STEEL EVALUATED IN TERMS OF FRACTURE TOUGHNESS.
Technical research rept.,
by Joseph H. Mulherin, and Edward H. Hess.
Nov 65, 35p. Rept. no. R-1782
Proj. DA-1C024401A328

Unclassified report

Descriptors: (*Steel, Stress corrosion), (*Stress corrosion, Steel), Fracture (Mechanics), Toughness, Silicon alloys, Maraging steel, Nickel alloys, Molybdenum alloys, Cobalt alloys, Tensile properties

The stress-corrosion susceptibility of several ultrahigh strength ferrous alloys is described on the basis of fracture mechanics parameters. Two general conditions were considered: first, the susceptibility of a material at various levels of tensile yield strength and fracture toughness; and second, susceptibility as a function of applied subcritical stress intensity levels. Experimentally, a notched and fatigue-cracked bendbar specimen configuration was used. Under a subcritical load, fracture of the specimen occurs upon sufficient environmentally influenced crack extension. The susceptibility criterion adopted in this investigation was the time period to catastrophic fracture of the specimen. The results are evaluated in terms of strength level and fracture toughness, and the usefulness of the data generated is examined in terms of material evaluation and application. (Author)

AD-626 186 Fld. 11/6, 11/11, 13/8
CFSTI Prices: HC $2.00 MF $0.50
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
DEVELOPMENT OF A RUST-REMOVING CORROSION PREVENTATIVE.
Final technical rept. 21 May 64-20 Maay 65,
by David B. Boies. Aug 65, 44p. Rept. no. IITRI-C6032-17
Contract DA-11-070-AMC-481 (W) Proj. DA-1C024401A109

Unclassified report

Descriptors: (*Corrosion inhibition, Storage), (*Iron, Corrosion inhibition), Steel, Iron alloys, Waxes, Amides, Sulfonic acids, Toluenes, Salicylic acids, Chelate compounds, Oleic acids, Amines, Cleaning

Removable corrosion preventatives were developed that, when applied to rusted steel or iron surfaces, remove or adsorb the rust during storage and prevent further eeterioration. It was necessary to use semipolar wax-base materials in order to provide sufficient rust-removing activity. Fatty amides were used as the was base in all of the formulations. The rust-removing activity was supplied by materials of an acidic nature, p-toluene sulfonic acid or salicylic acid, or by chelating agents of the beta-diketone class. The diamide of oleic acid and diethylenetriamine was added as a corrosion inhibitor. The formulations are effective in removing light rust films, and they provide protection against rerusting under inside storage conditions. (Author)

AD-626 225 Fld. 11/6, 13/8
CFSTI Prices: HC $4.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
SOLIDIFICATION OF IRON BASE ALLOYS AT LARGE DEGREES OF UNDERCOOLING.
Interim rept. 1 Oct 64-30 Sep 65,
by T. Kattamis, and M. C. Flemings. 30 Sep 65, 120p. Contract DA-19-020-AMC-0231 (X)
Proj. DA-1A-244-1A110
AMRA CR-64-07/2

Unclassified report

Descriptors: (*Iron alloys, Freezing), (*Nickel alloys, Freezing), (*Steel, Freezing), Copper alloys, Carbon alloys, Cooling, Phase studies, Microstructure, Crystallization, Diffusion, Melting, Castings

Study was made of structure and solute redistribution in bulk samples of iron and nickel base alloys undercooled up to 300 C. Alloys undercooled were iron-25 per cent nickel, iron-25 per cent nickel-0.3 per cent sulphur, iron-25 percent nickel-1.4 per cent carbon, nickel-25 percent copper, and AISI 4330 low alloy steel. Detailed morphology studies were conducted on nickel-25 per cent copper alloy. Results were nearly identical to those obtained earlier in iron-25 per cent nickel alloy. Cursory examination of other alloys indicates results obtained for the iron-nickel and nickel-copper alloy can be expected to apply to substantial degree to these systems. The dendrite element spacing, for cylindrical and spherical morphologies, decreases with increasing undercooling, increasing rate of heat extraction from the bulk sample, and decreasing distance from a chill surface. The transition of cylindrical to spherical morphology depends only on initial undercooling. The distribution of solute was studied metallographically and by electron microanalysis. Nickel concentration profiles and isoconcentration curves were established and segregation ratios measured in both internally chilled and non-internally chilled iron-25 per cent nickel specimens undercooled various amounts. (Author)

AD-626 239 Fld. 11/6, 20/11
SOUTHWEST RESEARCH INST SAN ANTONIO TEX DEPT OF MECHANICAL SCIENCES
DYNAMIC DEFORMATION OF METALS,
by Ulric S. Lindholm. 1965, 20p. Contract DA-31-124-ARO (D)-273 ,DA-23-072-ORD-1674

AROD 3134:5

Unclassified report

Availability: Published in Behavior of Materials Under Dynamic Loading; The American Society of Mechanical Engineers p42-60 1965. Copies to DDC users only.

Descriptors: (*Metals, Deformation), Dynamics, Tests, Mechanical properties, Strain (Mechanics), Compressive properties, Stresses, Creep

The paper discusses the mechanical testing of metals over a wide range in strain rates. The experimental methods described are the split Hopkinson pressure bar for uniaxial compression testing and a new pneumatic machine for dynamic testing under combined stress conditions. Results are presented for a number of metals. Theoretical aspects of rate sensitive plastic deformation of metals are discussed briefly in terms of thermally activated dislocation mechanisms. (Author)

AD-626 374 Fld. 11/6, 20/11, 13/10
CFSTI Prices: HC $1.00 MF $0.50
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD
STRESS-CORROSION STUDIES OF ALUMINUM ALLOY 7079-T6 IN SEAWATER,
by George A. Wacker. Jan 66, 22p. Rept. no. MEL-444/65
Proj. S-F020-01-06

Unclassified report

Descriptors: (*Aluminum alloys, Stress corrosion), (*Stress corrosion, Aluminum alloys), Sea water, Microstructure, Stresses, Tensile properties, Elongation

The stress-corrosion susceptibility of Aluminum Alloy 7079 in the T6 temper was investigated as a function of longitudinal, long-transverse, and short-transverse plate orientations. The alloy was found to be susceptible to stress-corrosion and pitting attack. Specimens oriented in the short transverse direction had the lowest resistance to damage in seawater. Variations in orientation-dependent stress-corrosion cracking susceptibility were related to microstructural characteristics. The alloy is considered unsuitable for naval applications under conditions conducive to stress corrosion. (Author)

AD-626 410 Fld. 11/6, 20/2
CFSTI Prices: HC $2.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
TEXTURES IN TITANIUM SHEET AND ITS EFFECTS ON PLASTIC FLOW PROPERTIES,
by Frank R. Larson. Oct 65, 29p. Rept. no. AMRA-TR-65-24
Proj. DA-1C024401A110 Task 35832

Unclassified report

Descriptors: (*Titanium alloys, Grain structure (Metallurgy)), (*Creep, Titanium alloys), Plasticity, Sheets, Anisotropy, Deformation, Tensile properties, Mechanical properties, Single crystals, Microstructure, Theory, Yield point

The anisotropic behavior of polycrystalline material depends upon the variation of properties of single crystals as a function of orientation and the perfection or intensity of the texture. The understanding of such behavior patterns must be related to a knowledge of textural variations and single crystal properties. Hexagonal close-packed metals usually exhibit fairly large anisotropy in the single crystal form and the textures that develop during processing are more intense for this structure. The anisotropic behavior patterns of polycrystalline hexagonal materials are quite large. Textures commonly found in titanium and its alloys can be classified according to processing procedures of the alloy and the mill products. Sheet textures may be described as rotated (0001) textures in which the peak is tilted toward the transverse direction between 30 and 60 degrees. A study of the microstructure and alloy compositional effects shows that beta rolling increases the transverse tilt of the basal poles. The effect of increasing additions of beta stabilizing elements is similar to that of beta rolling. A variety of alloys in sheet form have been tested and the anisotropy of mechanical properties measured. It was discovered that the elastic and plastic flow properties are intimately related. Both of these properties, plus yield strength, can be understood from a knowledge of single crystal properties, assuming that the sheet has a very strong texture. (Author)

AD-626 427 Fld. 11/6
BRIGHAM YOUNG UNIV PROVO UTAH
VOLUME MEASUREMENTS ON CHROMIUM TO PRESSURE OF 30 KILOBARS,
by William E. Evenson, and H. Tracy Hall. 7 Sep 65, 1p. Contract DA-ARO (D)-31-124-G633
AROD 2723:7

Unclassified report

Aailability: Published in Science v150 n3700 P1164-5 Nov 26 1965. Copies to DDC users only.

Descriptors: (*Chromium, Compressive properties), Volume, High-pressure research, Resistance (Electrical), X-ray diffraction analysis, Transition elements, Antiferromagnetism, Paramagnetic materials, Crystal structure

The unit cell volume of chromium was measured as a function of pressure from 1 bar to 30 kilobars by x-ray diffraction techniques. The antiferromag-

netic transition occurred at 1.5 kilobars at 29C, where there is a discontinuity in the slope of the curve for lattice parameter vs. pressure. By electrical resistance measurements the value of -delta T sub N/delta P was determined to be 5.9 degrees = 0.3 degrees per kilobar. At room temperature chromium remains in the body-centered cubic crystal structure from 0 to 44 kilobars. (Author)

AD-626 586 Fld. 11/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
EFFECT OF DEEP OCEAN ENVIRONMENTS ON THE CORROSION OF SELECTED ALLOYS.
Technical note,
by Fred M. Reinhart. Oct 65, 32p. Rept. no. TN-N-781
Proj. Y-F015-01-05-002a

Unclassified report

Descriptors: (*Alloys, Corrosion), Aluminum alloys, Copper alloys, Nickel alloys, Stainless steels, Corrosion-resistant alloys, Deep submergence, Pressure, Liquid immersion tests, Sea water, Austenite, Steel

This is a partial report covering eight materials selected as representative of the different classes of alloys exposed in the Pacific Ocean at depths ranging from 2340 to 5640 feet for periods of time ranging from 123 to 1064 days. Aluminum alloy, 5086-H34, was attacked by intergranular corrosion which was manifested by pitting and edge penetration. It was also attacked by crevice corrosion. Its corrosion rates and pit depths increased with time of exposure. Copper alloy No. 715, alloy steel A1S1 4130 and the extra high strength low alloy steels corroded uniformly; their corrosion rates decreasing with increasing time of exposure regardless of depth. The nickel base alloy, Hastelloy C, was uncorroded. The austenitic stainless steel, 20-CB, also was uncorroded except for crevice corrosion after 197 days of exposure at a depth of 2340 feet. No significant effect of pressure on the corrosion behavior of these alloys is evident from the data presented. (Author)

AD-626 598 Fld. 11/6
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
LIQUID STATE OF METALS,
by Dimitri Vvedenskii. 29 Oct 65, 44p. Rept. no. ATD-B-65-95
TT 66-60264

Unclassified report

Annotated bibliography based on Soviet-bloc opensource publications for Jan 64-Aug 65.

Descriptors: (*Liquid metals, Bibliographies), (*Bibliographies, Liquid metals), USSR, Abstracts, Alloys, Physical properties, Thermochemistry, Melting, Eutectics, Diffusion, X-ray diffraction analysis, Thermodynamics

This annotated bibliography was compiled from SovietSatellite open sources published 1964-1965. It is the first in a series. The report is divided into two sections with data published in 1964 making up the first and data published in 1965 comprising the second. Information covered includes the following: selenium, iron, chromium, silicon, rare earth elements, nickel, sodium alloys, antimony-bismuth system, copper, cadmium-bismuth alloy, lead-tin alloy, magnetic susceptibility, germanium, liquid metal structure, sulfur, aluminum, electrode polarization, liquid metal self-diffusion, electrotransfer, indium-antimony alloys, temperature resistivity, liquid alkali metals, radiation scattering, melt density, thermochemistry, tin, Hall constant, liquid eutectics, x-ray diffraction analysis, steel, electroconvective diffusion, germanium alloys, electrokinetic effect, titanium, ultrahigh pressure melting, zirconium, aluminum oxide wetting, lead, cobalt-silicon system. (Author)

AD-626 622 Fld. 11/6, 13/8
CFSTI Prices: HC $3.00 MF $0.75
WESTINGHOUSE ASTRONUCLEAR LAB PITTSBURGH PA
PILOT PRODUCTION AND EVALUATION OF TANTALUM ALLOY SHEET.
Summary phase rept. pt. 3 28 Apr 64-30 Oct 65,
by R. L. Ammon, A. M. Filippi, and D. L. Harrod. 30 Oct 65, 73p. Rept. no. WANL-PR-M-014-Pt-3
Contract NOw-64-0394-d

Unclassified report

Descriptors: (*Tantalum alloys, Sheets), (*Sheets, Tantalum alloys), Tungsten alloys, Hafnium alloys, Manufacturing methods, Forging, Rolling (Metallurgy), Casting, Mechanical properties, Microstructure, Melting, Welding, Heat treatment

Two 80-pound, 4-inch diameter double arc cast T-222 ingots were produced and converted to three wide sheets. Excellent primary (forging) and secondary (rolling) fabricability was displayed by the material, and an approximately 1/3 ingot-to-sheet conversion yield was obtained. The sheets displayed physical and mechanical properties comparable to those previously reported for T-222, as well as good product consistancy. Light microscopy, electron microscopy, and x-ray diffraction techniques were employed to study the morphology and structure of precipitated phases in T-222. Second phases present after aging T-222 were found to be dependent upon mechanical-thermal history. For example, aging as-rolled material at temperatures from 1600 to 2000F produced the FCC monocarbide phase, (Hf,Ta,W)C, while in contrast aging solution treated material in this temperature range produced the HCP dimetal carbide phase only, (Ta,W,Hf)2C. Preferential grain boundary nucleation or phase stabilization due to dissolved oxygen or nitrogen are thought to be probable explanations for the anomolous behavior. Analysis of metallographic and mechanical property data on T-222 indicate that the interstitial strengthening effect may result from immobilization of dislocations by strain induced precipitation and/or precipitation during cooling from the solution annealing temperature. Results of this study also indicate that the optimum metallurgical condition for T-222 alloy is that obtained by recrystallization and solution annealing. (Author)

AD-625 696 See Fld. 20/11

AD-625 709 See Fld. 20/3

AD-625 800 See Fld. 11/3

AD-625 806 See Fld. 13/10

AD-625 902 See Fld. 20/13

AD-625 903 See Fld. 20/13

AD-626 124 See Fld. 19/4

AD-626 126 See Fld. 19/4

AD-626 206 See Fld. 18/8

AD-626 213 See Fld. 11/3

AD-626 376 See Fld. 13/8

AD-626 466 See Fld. 18/10

AD-626 547 See Fld. 7/2

AD-626 583 See Fld. 13/8

AD-626 593 See Fld. 10/2

AD-626 599 See Fld. 13/8

AD-626 601 See Fld. 13/8

11/7. MISCELLANEOUS MATERIALS

AD-625 928 Fld. 11/7, 13/6, 21/7
CFSTI Prices: HC $0.50 MF $0.50
COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD
EXTENDED USE OF IMPROVED COOLING SYSTEM INHIBITOR-FIELD EVALUATION.
Interim rept.,
by James H. Conley. 3 Dec 65, 12p. Rept. no. CCL-190
Proj. DA-IC024401A109

Unclassified report

Descriptors: (*Corrosion inhibition, Coolants), (*Coolants, Corrosion inhibition), Freezing point depressants, Additives, Liquid cooled, Internal combustion engines, Maintenance, Life expectancy, Passenger vehicles

The object of this investigation is to determine if Federal Specification 0-1-490a,,, Corrosion Inhibitor is suitable for use in vehicle cooling systems for extended periods. The improved inhibitor was placed in the vehicle cooling systems with antifreeze compounds meeting Federal Specification 0-A-548a, Type I, or commercial materials similar to the Type I. The inhibitor was added at the rate of 1 ounce per 2 quarts of water used in making up the antifreeze solution. Four government vehicles and four private passenger cars were utilized for test. Solutions were checked every three months and if necessary the coolant freezing point, pH value and reserve alkalinity (R.A.) value were adjusted. Data indicates that inspection periods of longer than three months permits the coolant to get out of control. In the event the Army adopts the continued use of antifreeze solutions for two years, the coolant solutions must be checked every three months by technical personnel and adjusted, if necessary, to insure safe continued use. (Author)

AD-625 904 See Fld. 9/1

AD-626 295 See Fld. 7/5

AD-626 314 See Fld. 20/5

11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

AD-625 833 Fld. 11/8
CFSTI Prices: HC $2.00 MF $0.50
SOCONY MOBIL OIL CO INC PAULSBORO N J
STUDY AND EVALUATION OF THE OXIDATIVE AND DEPOSIT-FORMING PROPERTIES OF HIGH TEMPERATURE LUBRICANTS.
Technical rept. 1 Apr-1 Apr 65,
by S. J. Leonardi, and E. A. Oberright. Nov 65, 26p. Contract AF33 (615)-1367 Proj. AF-3044
Task 304401
APL TR-65-85

Unclassified report

Descriptors: (*Oils, Lubricants), (*Lubricants, Oxidation), Films, Heat-resistant materials, Tests, Airplane engine oils, Metals

A series of high temperature oils was evaluated in a high temperature thin film oxidation unit. The apparatus measures oxygen consumption and deposits formed by the oils in thin films on a rotating heated disk. The test exhibited excellent correlation with deposit formation in a jet engine. To simplify the selection of conditions for future testing requirements, the effects of several test variables were evaluated. These include test time, oil circulation rate, oxidation of the sump oil, dispersion of the sump air, and effects of metals in the sump. (Author)

AD-626 078 Fld. 11/8
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

EFFECTS OF ADDITIVES ON ANTIWEAR AND ANTIFRICTION PROPERTIES OF POLYSILOXANES,
by M. I. Nosov, and G. V. Vinogradov. Dec 65, 11p. Rept. no. FSTC-381-T65-553
TT 66-60197
Unclassified report

Trans. of Khimiya i Tekhnologiya Topliv i Masel (USSR) v10 n8 p50-3 1965.

Descriptors: (*Siloxanes, Lubricant additives), (*Lubricant additives, Siloxanes), Wear resistance, Friction, Additives, USSR, Organic sulfur compounds, Organic phosphorus compounds, Hydrogenated hydrocarbons, Steel, Lubrication, Lubricants

The effect of some organic compounds containing sulfur, chlorine, and phosphorus on the lubricating action of polysiloxanes of various types under heavy friction loads were studied. Additives that show a high activity in preventing scoring of steel in hydrocarbon lubricating media were much less effective in polysiloxanes. Their activity decreased sharply on transition from polyethylsiloxane to polymethylsiloxane and then to polymethylphenylsiloxanes. They almost had no effect on the lubricating capacity of polymethylphenylsiloxanes. The assumption is made that the decomposition of wellknown additives, which determines their effectiveness in preventing scoring of steel, initiates chain reactions in which the principal components of lubricating oils participate. With increasing stability of lubricating media to reactions in which free radicals take part, the activity of additives that counteract scoring decreases. This explains the lack of effectiveness in polymethylphenylsiloxanes of the additives considered. (Author)

AD-626 440 Fld. 11/8
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
LUBRICANT GREASES BASED ON SYNTHETIC FATTY ACIDS.
4 Apr 62, 4p. Rept. no. AID-62-42
TT 66-60239
Unclassified report

Descriptors: (*Lubricants, Preparation), (*Greases, Preparation), (*Fatty acids, Lubricants), Reviews, USSR

The following Soviet publications are reviewed: Production of lubricants, no. 6-8; Leningrad, 1961; 199p. 'Effect of the fractional composition of synthetic fatty acids on the thermal stability and service properties of sodium greases': Khimiya i technologiya topliv i masel, no. 2, Feb 1962, p. 53-59.

AD-626 582 Fld. 11/8
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
HIGH TEMPERATURE OXIDATION INHIBITION OF ALUMINUM COMPLEX SOAP GREASE.
Technical rept.,
by Max T. Fisher. Nov 65, 23p. Proj. DA-1C024401A107
RIA 65-3264
Unclassified report

Descriptors: (*Aluminum soaps, Antioxidants), (*Greases, Antioxidants), (*Lubricant additives, Antioxidants), (*Antioxidants, Effectiveness), Phenyl ethers, Amines, Concentration (Chemistry), Pressure, Thermal properties

The aluminum complex soap greases made previously (see AD-610 560) had good high and low temperature shear properties and good oxidation stability at 210F but at 250F were deficient in the latter property. Efforts to correct this deficiency consisted of incorporating antioxidants which had proved effective at the higher temperature in other grease types. The antioxidants were generally less effective at 250F in these aluminum base greases than they were in other greases at the same temperature. Two of the inhibitors, 2,4'-diisopropyl amino diphenyl ether and a proprietary mixture of complex organic amines, did impart superior resistance to oxidation at 250F. The former, in a one percent concentration, limited the pressure drop to 25 psi in 400 hours and a 27 psi drop in 400 hours was recorded using the latter material in a 0.3 percent concentration. This work shows that it will be difficult to find antioxidants for limiting the pressure drop of aluminum complex soap grease to 20 psi in 400 hours at 250F. (Author)

11/9. PLASTICS

AD-625 680 Fld. 11/9, 7/3
CFSTI Prices: HC $3.00 MF $0.75
GENERAL PRECISION INC LITTLE FALLS N J AEROSPACE RESEARCH CENTER
HIGH-TEMPERATURE-RESISTANT PHTHALOCYANINE POLYMERS.
Final rept. 1 Nov 64-31 Oct 65,
by P. Jaffe. 1 Nov 65, 95p. Contract NObs-92081 Proj. SR-0007-04-01 Task 1050
Unclassified report

Descriptors: (*Heat-resistant plastics, Phthalocyanines), (*Phthalocyanines, Polymerization), (*Silicon compounds, Phthalocyanines), (*Organoboranes, Phthalocyanines), Preparation, Purification, Chlorine compounds, Copolymerization, Polyethylene plastics, Stability, Silicone plastics, Ageing (Materials), Condensation reactions, Nitriles, Thiocyanates, Siloxanes

A method was developed for the large-scale preparation and subsequent purification of dichlorosilicon phthalocyanine. This important monomer intermediate was then converted to various derivatives, including dihydroxysilicon phthalocyanine, diisocyanatosilicon phthalocyanine and dithiocyanatosilicon phthalocyanine. The chemistry of the metallophthalocyanine pseudohalides showed anomalous behavior. Treatment of these monomers under a variety of reaction conditions with bis (hydroxymethyl) carborane gave similar but not identical bis (oxymethyl) carboranesilo xyphthalocyanine condensation copolymer intermediates. Five distinct methods for the synthesis of this copolymer system were developed. Depending on the method of synthesis, the various bis (oxymethyl)carborane- siloxyphthalocyanine copolymer products showed selective and good solubility in benzene, toluene, amines or other solvents. Various polymer chain extension and cross-linking techniques were investigated. A by-product of this work was the development of a route to poly (carboranylethyl)etylenes. Thermal stability tests were run on some model compounds and on the 3:2 bis (hydroxymethyl) carborane- siloxyphthalocyanine condensation copolymer. The heat resistance of PcAlCl (540C) is superior to that of PcSiC12 and PcTiO (450C) and the copolymer intermediate is stable to about 360C in air. (Author)

AD-625 798 Fld. 11/9
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF OBTAINING HARD POLYMERS FROM N-PHENYLIMIDE OF MALEIC ACID,
by V. S. Ivanov, T. A. Sukhikh, A. Kh. Breger, V. B. Osipov, and V. A. Goldin. 27 Oct 65, 6p. Rept. no. FTD-TT-65-816
TT 66-60145
Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 832, appl. no. 788452/23, 26 Jul 62.

Descriptors: (*Imides, Polymerization), (*Polymers, Imides), (*Heat-resistant plastics, Preparation), Aromatic compounds, Radiation chemistry, Patents, USSR

The object of the invention is a method of obtaining hard polymers of N-phenylimide of maleic acid which is distinguished by the feature that, for the purpose of obtaining thermally and chemically resistant material, the N-phenylimide of maleic acid is subjected to the action of ionizing radiation at a temperature not higher than, but near to, the melting point, after which the radiated product is heated up to 100C. For the purpose of getting the polymer mainly in the crystalline or the amorphous state, the radiation is varied between 2 and 10 Mr. (Author)

AD-626 154 Fld. 11/9, 7/4, 20/11
CFSTI Prices: HC $4.00 MF $0.75
MELLON INST PITTSBURGH PA
THE RELATIONSHIP BETWEEN MOLECULAR STRUCTURE, MORPHOLOGY, AND THE MECHANICAL PROPERTIES OF POLYMERIC MATERIALS.
Technical rept. for 1 Mar-31 Aug 65,
by Guy C. Berry, Meyer H. Birnboim, William H. Hoffman, Joseph H. Magill, and Hershel Markovitz. 31 Aug 65, 103p. Rept. no. TR-14
Contract Nonr-2693 (00) Proj. NR-356-407
Unclassified report

See also AD-6155 595.

Descriptors: (*Polymers, Mechanical properties), (*Polycyclic compounds, Crystallization), (*Polyamide plastics, Crystal structure), (*Films, Optical properties), (*Polyethylene plastics, Molding), (*Styrene plastics, Viscoelasticity), Naphthalenes, Benzenes, Crystal growth, Single crystals, Nylon, Siloxanes, Epoxy plastics, Light, Scattering, Glass, Creep

Contents: Crystallization kinetics of 1:3:5 tri-alphanaphthyl benzene, by J. H. Magill and D. J. Plazek; Formation of spherulites in polyamide melts: Part III 'even-even' polyamides, by J. H. Magill; Light scattering from crystalline polymer films, by G. C. Berry, J. H. Magill, and M. H. Birnboim; Polyethylene - sample molding, by W. M. Hoffman and M H. Birnboim; Viscoelastic behavior of polystyrene, by D. J. Plazek.

AD-626 179 Fld. 11/9, 14/2
CFSTI Prices: HC $2.00 MF $0.50
PICATINNY ARSENAL DOVER N J PLASTICS AND PACKAGING LAB
IMPACT COMPRESSION CAPABILITIES FOR TESTING REINFORCED PLASTIC MEMBERS.
Technical rept.,
by Adolph E. Slobodzinski. Jan 66, 40p. Rept. no. TR-3263
Proj. DA-1C024401A110
Unclassified report

Descriptors: (*Impact shock, Compressive properties), (*Plastics, Test equipment), Reinforcing materials, Loading (Mechanics), Deformation, Velocity, Measurement, Glass textiles

An available experimental compression tester was automated to attain reproducible impact velocities. The tester was a gas-operated, block-block type. Reproducibility of velocity was attained to within =5%. An SR-4 gaged weight-bar was used as the load sensor for the tests. No way was found to predict the magnitude of the load that would be applied to the columns and it was found that the load capacity of the sensor could be easily exceeded. Preliminary evaluations were conducted on the applicability of optical methods to the measurement of deformations. A design for a proposed bar-type compression tester is described. The proposed tester was designed to meet the following specifications: (1) Cause a 25-pound projectile to attain impact velocities to 1760 inches per second (100 miles per hour). (2) Be capable of applying

loads to 70,000 pounds at rates ranging from 1 to 10 inches perminute. (Author)

AD-626 375 Fld. 11/9, 13/8, 9/1
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO HUDSON FALLS N Y CAPACITOR DEPT
PRODUCTION ENGINEERING MEASURE. POLYCARBONATE PLASTIC FILM.
Quarterly rept. no. 2, 18 Aug-18 Nov 65.
18 Nov 65, 26p. Contract DA-36-039-AMC-06165 (E)
Unclassified report

See also AD-621 557.

Descriptors: (*Polyester plastics, Dielectric films), (*Dielectric films, Polyester plastics), Manufacturing methods, Dielectric properties, Extrusion, Thickness, Tensile properties, Friction, Finishes + finishing, Surface properties, Films

The extrusion equipment was completely set up and debugged for film operation, returning to the baseline conditions established previously. The manual feed system was evaluated and set up in a manner that eliminates moisture streaks. The biaxial orientation equipment was installed and mechanically debugged. The extrusion conditions for producing non-textured poly-carbonate film were optimized, and a series of 24-hour runs was made producing 2000 pounds of 0.4 mil and 1000 pounds of 0.5 mil film. (Author)

AD-625 816 **See Fld. 1/3**

AD-625 851 **See Fld. 13/10**

AD-625 952 **See Fld. 5/1**

AD-626 066 **See Fld. 13/8**

AD-626 110 **See Fld. 7/4**

AD-626 188 **See Fld. 7/4**

AD-626 206 **See Fld. 18/8**

AD-626 474 **See Fld. 18/8**

AD-626 623 **See Fld. 7/3**

11/10. RUBBERS

AD-625 815 Fld. 11/10, 7/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY NATICK LABS MASS
RESEARCH COMPOUNDING OF NITROSO RUBBER.
Final rept. Dec 63-Sep 65,
by Charles B. Griffis. Oct 65, 20p. Rept. no. C/OM-13
Proj. DA-1C024401A329
Unclassified report

Descriptors: (*Synthetic rubber, Production), (*Halocarbon plastics, Production), (*Methane, Fluorine compounds), (*Ethylenes, Fluorine compounds), Amines, Polymers, Aging (Materials), Crosslinking (Chemistry), Reinforcing materials, Physical properties, Vulcanization, Vulcanizates, Silicone plastics

Nitroso rubber, a copolymer of trifluoronitrosomethane and tetrafluoroethylene, has been made in pilot-plant quantity by the Thiokol Chemical Corporation under Army Contract DA19-129-AMC-69 (AD-439 696). Research compounding studies have been made on this pilot-plant production rubber. A variety of cross-linking (vulcanization) agents were investigated, the most effective of which was triethylene-tetramine. Of a series of reinforcing fillers used, the best physical properties were obtained with HiSil 303. However, a silicone-treated HiSil 233 gave comparable results. The curing characteristics of the nitroso rubber made in the pilot plant at the Thiokol Chemical Corporation were different from those of the material prepared in the laboratory of the Minnesota Mining and Manufacturing Company (AD-418 638). Based on the research compounding studied made, there is no indication that rubber compounds having excellent physical properties can be made from the Thiokol Chemical Corporation nitroso rubber. (Author)

AD-626 208 Fld. 11/10, 20/11
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO
NONLINEAR RUBBERLIKE VISCOELASTICITY: A MOLECULAR APPROACH.
Rept. for Mar 64-Mar 65,
by John C. Halpin. Oct 65, 28p. Rept. no. afml-TR-65-107
Proj. AF-7342 Task 734202
Unclassified report

Descriptors: (*Viscoelasticity, Nonlinear systems), (*Vulcanizates, Viscoelasticity), Rubber, Elastomers, Deformation, Molecules, Kinetic theory, Integral equations, Series, Creep, Stresses, Strain (Mechanics)

The paper presents a treatment of the large nonlinear ddeformational response of amorphous elastomeric materials. In the development presented the difference between the dynamic and equilibrium tension in a macromolecular chain is expressed as a 'functional'. The functional is expanded in a series analogous to Taylor's series and higher terms are neglected to obtain a linear integral equation for the viscously retarded d response of the network chain. The equation obtained corresponds to a generalized one-dimensional version of Boltzmann's superposition equation on the macroscopic scale. It is then shown that the time dependent response of the molecular chain is independent of the magnitude of the deformation and, consequently, is of the same analytical form whether the deformation is infinitesimal or finite. From this it necessarily follows that there cannot be an inconsistency at finite stress and strain which is not allowed at infinitesimal excitations. Thus the response at finite excitations can be treated generally by employing the 'generalized' superposition equation and the same techniques which have been utilized in the linear theories. By employing the usual kinetic theoeeory assumptions, equations are developed for the macroscopic response of a well vulcanized rubber. Experimental data obtained in creep, stress relaxation, and dynamic stress-strain for three different elastomers are presented which support the approach outlined. Some consequences of the theory are discussed. (Author)

AD-626 581 Fld. 11/10
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
SEMI-INORGANIC HEAT RESISTANT ELASTOMERS BASED ON BORON.
Technical rept.,
by L. G. Wiedenmann. Nov 65, 16p. Proj. DA-1C014501B13A
RIA 65-3182
Unclassified report

Descriptors: (*Heat-resistant plastics, Boranes), (*Elastomers, Boranes), (*Inorganic polymers, Boranes), (*Boron compounds, Copolymerization), Chlorine compounds, Silanes, Siloxanes, Elasticity, Vulcanization, Aging (Materials)

The preparation of high temperature resistant elastomers containing boron was attempted. A copolymer obtained from dimethyldichlorosilane and 1,1':2,2'-bis- (chloromethylsilylene) -bis 1,2-dicarbadodecaborane (12) cured into a resin. An air oven aged sample showed an equilibrium weight loss of 9 percent at 316C (40 hours) and 23 percent at 450C (2 hours). An elastomeric chain copolymer (MW 68,000) obtained from the reaction of bis (chlorodimethylsilyl) 1,7-dicarbadodecaborane with octamethyl cyclotetrasiloxane lost its elasticity after air oven aging 2.5 hours at 316C (weight loss 7.3 percent). (Author)

AD-625 935 **See Fld. 7/3**

AD-626 206 **See Fld. 18/8**

11/11. SOLVENTS, CLEANERS AND ABRASIVES

AD-626 186 **See Fld. 11/6**

11/12. WOOD AND PAPER PRODUCTS

AD-626 584 **See Fld. 13/8**

AD-626 640 **See Fld. 7/3**

12/1. MATHEMATICS AND STATISTICS

AD-625 770 Fld. 12/1
NEW SOUTH WALES UNIV KENSINGTON (AUSTRALIA) DEPT OF APPLIED MTHEMATICS
UPPER AND LOWER BOUNDS ON GENERALIZED FOURIER COEFFICIENTS,
by L. M. Delves. 11 Oct 63, 8p. Contract AF-AFOSR-62-400
AFOSR 65-1750
Unclassified report

Availability: Published in Journal of Mathematical Physics v5 n8 p1055-60 Aug 1964. Copies to DDC users only.

Descriptors: (*Fourier analysis, Calculus of variations), (*Calculus of variations, Fourier analysis), Functional analysis, Sequences, Harmonic analysis, Australia

Methods are given for obtaining variational upper and lower bounds on the nth Fourier coefficient of a function g relative to a sequence of eigenfuctions. The, methods differ in their ease of application and in the amount of information required concerning the eigenvalues associated with the eigenfunctions. Some illustrative examples are given. (Author)

AD-625 773 Fld. 12/1
CFSTI Prices: HC $1.00 MF $0.50
NATIONAL BUREAU OF STANDARDS WASHINGTON D C
COMBINATORIAL MATHEMATICS.
Final rept. 1 Jun 62-1 Jun 65,
by Jack Edmonds. 1 Jun 65, 4p. Contract CRD-AA-L-P-3532
AROD 3532:8
Unclassified report

Descriptors: (*Combinatorial analysis, Algorithms), Optimization, Graphics, Matrix algebra, Linear programming

Combinatorics is the mathematics of discrete arrangement. Combinatorics and numerics play complementary roles in computational methodology. The purpose of the project was theoretical development of combinatorics with emphasis on computational methods. Besides matching theory, the other most important topic developed under the project is matroid theory.

AD-625 827 Fld. 12/1, 9/2
CFSTI Prices: HC $2.00 MF $0.50
DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN
PROGRAM SPECT: POWER SPECTRAL ANALYSIS OF A RANDOM PROCESS USING THE CDC 1604 COMPUTER,

by G. E. Ellis, and R. L. Boston. 8 Dec 65, 35p.
Rept. no. DRL-A-252
Contract N62306-1358

Unclassified report

Descriptors: (*Programming (Computers), Stochastic processes), (*Statistical analysis, Programming (Computers)), Time, Series, Statistical functions, Ocean waves, Analysis

The report is a discussion of a numerical procedure for computing power density spectral estimates from sampled time series records following the methods of Blackman and Tukey. (The Measurement of Power Spectra', Dover Publications, Inc., New York, 1958). SPECT is the computer program written for the CDC 1604 digital computer for this purpose, and a complete listing along with sample data and output have been included. (Author)

AD-625 915 Fld. 12/1
CFSTI Prices: HC $3.00 MF $0.75
STATE UNIV OF NEW YORK STONY BROOK COLL OF ENGINEERING
A TABLE OF DISTRIBUTIONAL MELLIN TRANSFORMS: I.
Scientific rept. no. 6,
by Timothy A. Loughlin. 15 Jun 65, 82p. Rept. no. 40
Contract AF19 (628)-2981 Proj. AF-5628 Task 562806
AFCRL 64-645

Unclassified report

See also AD-608 099.

Descriptors: (*Integral transfoorms, Tables), (*Distribution theory, Integral transforms), Functional analysis, Transformations (Mathematics)

A list of distributional Mellin transforms is derived. Singular distributions that are considered include delta functionals and pseudofunctions obtained from Hadamard's Finite Part. The ordinary distributionoons include algebraic and elementary transcendental functions. Proofs or derivations are provided for all results. (Author)

AD-625 965 Fld. 12/1, 20/4
SPACE SCIENCES INC WALTHAM MASS
ASYMPTOTIC SOLUTIONS OF THE BHATNAGARGROSS-KROOK EQUATION,
by L. K. Chi. 14 Dec 64, 4p. Contract AF49 (638)-1228 Proj. AF-9783 Task 978301
AFOSR 65-1743

Unclassified report

Availability: Published in The Physics of Fluids v8 n5 p991-2 5 May 1965. Copies to DDC users only.

Descriptors: (*Asymptotic series, Partial differential equations), (*Partial differential equations, Asymptotic series), (*Boundary layer, Equations), Two-dimensional flow, Fluid mechanics

The relationship between the Boltzmann equation and the boundary-layer equations is investigated. It is shown that the boundary-layer equations can be derived directly from the Bhatnager-Gross-Krook model of the Boltzmann equation by coupling the Chapman-Enskog procedure with the boundary analysis. For illustration, the 2-dimensional monatomic gas flow past a semi-infinite flat plate is considered. The boundary-layer equations and the Navier-Stokes equations are found to be different asymptotic forms of the Bhatnagar-Gross-Krook equation in different limiting processing. (Author)

AD-625 978 Fld. 12/1
AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC N J
CONSTRUCTIVE APPROACH IN THE METHOD OF EXTENSION,
by G. Sandri, and R. Sullivan. 22 Apr 65, 4p.
Contract AF49 (638)-1461 Proj. AF-9783 Task 978302
AFOSR 65-1746

Unclassified report

Availability: Published in Il Nuovo Cimento Series 10 v37 p1799-1800 16 Jun 1965. Copies to DDC users only.

Descriptors: (*Series, Exponential functions), Statistical mechanics, Functions

A constructive procedure is presented to determine the fundamental variables required by a method of extension introduced earlier. The construction allows for the introduction of arbitrary scaling functions which are determined by the requirement that the expansion of the unknown function be uniformly valid. The theory is illustrated through the example of a exponential decay. (Author)

AD-626 118 Fld. 12/1
CORNELL UNIV ITHACA N Y
TESTS OF FIT BASED ON THE NUMBER OF OBSERVATIONS FALLING IN THE SHORTEST SAMPLE SPACINGS DETERMINED BY EARLIER OBSERVATIONS.
Revised ed.,
by Lionel Weiss. 29 Dec 60, 9p. Contract NSF-G-11321

Unclassified report

Revision of manuscript submitted 27 Nov 59.

Availability: Published in The Annals of Mathematical Statistics v32 n3 p838-45 Sep 1961. Copies to DDC users only.

Descriptors: (*Statistical tests, Stochastic processes), (*Distribution functions, Statistical tests), Sampling

AD-626 120 Fld. 12/1
WASHINGTON UNIV SEATTLE
ON FINITELY GENERATED MODULES OVER NOETHERIAN RINGS.
Revised ed.,
by J. P. Jans. 8 Jan 62, 13p. Contract NSF-G-11098

Unclassified report

Revision of manuscript submitted 16 Apr 61. See also AD-261 318.

Availability: Published in Transactions of the American Mathematical Society v106 n2 p330-40 Feb 1963.

Descriptors: (*Rings (Mathematics), Algebra), (*Algebra, Rings (Mathematics)), Projective geometry

AD-626 125 Fld. 12/1
CATHOLIC UNIV OF AMERICA WASHINGTON D C
ON THE INDEPENDENCE OF A SAMPLE CENTRAL MOMENT AND THE SAMPLE MEAN,
by R. G. Laha, E. Lukacs, and M. Newman. 11 Mar 60, 7p. Contract NSF-G4220 ,NSF-G9968

Unclassified report

Prepared in cooperation with National Bureau of Standards, Washington, D. C.

Availability: Published in The Annals of Mathematical Statistics v31 n4 p1028-33 Dec 1960. Copies to DDC users only.

Descriptors: (*Statistical analysis, Population (Mathematics), Sampling, Polynomials, Real variables, Theorems, Combinatorial analysis

The paper contains proof of the following theorem: Let X sub 1, X sub 2, ..., X sub n be a sample of size N from a certain population. Let p be a positive integer such that (p-1) is not divisible by N-1. The population is normal if and only if the sample central moment m sub p of order p is distributed independently of the sample mean X.

AD-626 169 Fld. 12/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A SYSTEM OF DENUMERABLY MANY TRANSIENT MARKOV CHAINS,
by Sidney C. Port. Jan 66, 19p. Rept. no. RM-4650-PR
Contract AF49 (638)-1700

Unclassified report

Descriptors: (*Probability, Statistical mechanics), (*Measure theory, Probability), Statistical processes, Invariance

If P is a transient Markov chain having the invariant measure m, and if at time 0 particles were distributed in the state space s according to the Poisson law, with mean m (x) at x, and then these particles move independently of the others according to the law P, the system maintains itself in macroscopic equilibrium. In this memorandum several phenomena connected with this system are investigated. (Author)

AD-626 222 Fld. 12/1
CFSTI Prices: HC $1.00 MF $0.50
ADELPHI UNIV GARDEN CITY N Y DEPT OF GRADUATE MATHEMATICS
A HOPFIAN FREE PRODUCT OF HOPFIAN GROUPS.
Final rept.,
by Donald Solitar. Dec 65, 9p. Rept. no. AGM-127
Contract Nonr (G)-0042-63 Proj. RR-003-01-01

Unclassified report

Descriptors: (*Groups (Mathematics), Combinatorial analysis), Theorems

It is shown that the free product of finitely many, finitely generated, completely indecomposable, Hopfian groups is again Hopfian. (Author)

AD-626 235 Fld. 12/1
NORTHWESTERN UNIV EVANSTON ILL
SOME HOMOTOPY GROUPS OF STIEFEL MANIFOLDS,
by C. S. Hoo, and M. E. Mahowald. 1965, 8p.
Contract DA-31-124-ARO (D)-144
AROD 4489:3

Unclassified report

Prepared in cooperation with Illinois Univ., Urbana.

Availability: Published in Bulletin of the American Mathematical Society v71 n4 p661-7 Jul 1965.

Descriptors: (*Algebraic topology, Groups (Mathematics)), Table .

AD-626 237 Fld. 12/1
NORTHWESTERN UNIV EVANSTON ILL
SOME WHITEHEAD PRODUCTS IN S (N),
by Mark Mahowald. 16 Nov 64, 11p. Contract DA-31-124-ARO (D)-144
AROD 4489:1

Unclassified report

Availability: Published in Topology v4 p17-26 1965. Copies to DDC users only.

Descriptors: (*Algebraic topology, Groups (Mathematics)), Spheres, Combinatorial analysis, Mappings (Transformations), Sequences

AD-626 290 Fld. 12/1, 5/10
ARMY MEDICAL RESEARCH LAB FORT KNOX KY EXPERIMENTAL PSYCHOLOGY DIV

NOTE ON THE USE OF THE CORRELATION COEFFICIENT.
by James N. Cronholm. 12 Feb 65, 5p. Proj. DA-3A014501B74C Task 3A014501B74C00 AMRL 642

Unclassified report

Availability: Published in Psychological Reports v16 p668 1965. Copies to DDC users only.

Descriptors: (*Statistical functions, Psychometrics), Effectiveness

The use of the Pearson product-moment correlation coefficient is usually regarded as being restricted to situations in which ratio, or at least interval measurement can be attained. This paper shows how the correlation coefficient can be computed from the category frequencies of two groups of nominally scaled observations. As a descriptive measure, r conveys a surprising amount of information about the relationship between 2 groups of observations, and retains its usual statistical properties. It is suggested that the correlation coefficient be considered as a supplement to more commonly used non-parametric measures of association. (Author)

AD-626 302 Fld. 12/1
JOHNS HOPKINS UNIV BALTIMORE MD
ON ISOMETRIC IMMERSIONS IN EUCLIDEAN SPACE OF MANIFOLDS WITH NON-NEGATIVE SECTIONAL CURVATURES,
by Philip Hartman. 3 Dec 63, 18p. Contract AF49 (638)-1382 Proj. AF-9749 Task 974902 AFOSR 65-1969

Unclassified report

Availability: Published in Transactions of the American Mathematical Society v115 n3 p94-109 Mar 1965.

Descriptors: (*Mapping (Transformations), Algebraic topology), Surfaces, Functions, Complex variables, Topology

AD-626 315 Fld. 12/1
CFSTI Prices: HC $3.00 MF $0.75
COMPUTER SCIENCE DIV STANFORD UNIV CALIF
ON THE APPROXIMATION OF WEAK SOLUTIONS OF LINEAR PARABOLIC EQUATIONS BY A CLASS OF MULTISTEP DIFFERENCE METHODS.
Technical rept.,
by Pierre Arnaud Raviart. 6 Dec 65, 62p. Rept. no. CS-31
Contract Nonr-225 (37) Proj. NR-044-211

Unclassified report

Descriptors: (*Approximation (Mathematics), Partial differential equations), (*Partial differential equations, Functional analysis), Difference equations, Stability, Boundary value problems

Evolution equations are considered of the form du (t)/dt + A (t)u (t) = f (t), 0 < or = t < or = T, f given, with the initial condition u (o) = u sub o, u sub o given, where each A (t) is an unbounded linear operator in a Hilbert space H, which is in practice an elliptic partial differential operator subject to appropriate boundary conditions.

AD-626 318 Fld. 12/1, 13/2, 12/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
ASYMTOTIC GROWTH CURVES WITH APPLICATIONS.
Technical Rept. for Jul 63-Jun 65,
by W. L. Wilcoxson. Dec 65, 75p. Rept. no. TR-R-419
Proj. Y-R011-01-01-061

Unclassified report

See also AD-421 443.

Descriptors: (*Curve fitting, Experimental data), (*Experimental data, Nonlinear systems), Mathematical models, Mathematical prediction, Programming (Computers), Oceanographic data, Anchors (Structural), Civil engineering, Shielding, Neutron scattering, Gammaray scattering, Maintenance, Vehicles, Costs

A recurring problem at the U. S. Naval Civil Engineering Laboratory (NCEL) concerns the fitting of experimental data to an empirical or semiempirical formula of nonlinear form. Such problems, which involve asymptotic growth curves, are not amenable to solution by the usual linear least squares curve fitting techniques. Since nonlinear curve fitting problems have arisen in connection with various NCEL tasks, it appeared desirable to devise and adapt general mathematical methods for treating a class of nonlinear problems. This report describes methods for performing nonlinear curve fits, together with a method for choosing the best of several possible empirical formulas. FORTRAN computer programs are provided, and applications to NCEL tasks are discussed. (Author)

AD-626 352 Fld. 12/1
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
WHY SIMPSON'S RULE,
by Millard H. Perstein. 19 Apr 65, 33p. Rept. no. SP-2028

Unclassified report

Descriptors: (*Integration, Numerical methods and procedures), (*Numerical methods and procedures, Integration), Effectiveness

Simpson's quadrature rule derives from a formula for the volume of certain geometrical solids or a formula for areas bounded by straight lines and thirddegree polynomials. It is one of a sequence of progressively more complex rules that apply exactly to progressively higher-degree polynomials. The use of such rules in situations where they are not exact is justified on the basis of theoretical error terms that decrease as the interval of integration is more finely subdivided. The error terms also depend on derivatives, often unknown, of the functions being integrated. Quadrature rules have been sought that are better suited to use in computing machines. This presents several rules that are generally better than Simpson's Rule, considering both accuracy and ease of application. (Author)

AD-626 354 Fld. 12/1
YALE UNIV NEW HAVEN CONN
FLOWS ON SOME THREE DIMENSIONAL HOMOGENEOUS SPACES,
by L. Auslander, L. Green, and F. Hahn. 1965, 5p. Contract DA-19-020-ORD-5254 Grant, NSF-G-11287

Unclassified report

Availability: Published in Bulletin of the American Mathematical Society v67 n5 p494-7 Sep 1961. Copies to DDC users only.

Descriptors: (*Mapping (Transformations), Groups (Mathematics)), (*Topology, Dynamics), Algebraic topology, Measure theory, Matrix algebra

AD-626 355 Fld. 12/1
YALE UNIV NEW HAVEN CONN
TOPOLOGICAL DYNAMICS ON NILMANIFOLDS,
by L. Auslander, F. Hahn, and L. Markus. 1965, 3p. Contract DA-19-020-ORD-5254 ,NSF-G-11287

Unclassified report

Availability: Published in Bulletin of the American Mathematical Society v67 n3 p298-9 May 1961. Copies to DDC users only.

Descriptors: (*Mapping (Transformations), Topology), (*Topology, Dynamics), Algebraic topology, Measure theory

AD-626 386 Fld. 12/1
CATHOLIC UNIV OF AMERICA WASHINGTON D C
ON A LINEAR FORM WHOSE DISTRIBUTION IS IDENTICAL WITH THAT OF A MONOMIAL,
by R. G. Laha, and E. Lukacs. 10 Mar 64, 11p. Contract AF-AFOSR-437-63 ,NSF-GP-96 AFOSR 65-1963

Unclassified report

Revision of manuscript submitted 14 Oct 1963.

Availability: Published in Pacific Journal of Mathematics v15 n1 p207-14 1965. Copies to DDC users only.

Descriptors: (*Distribution theory, Stochastic processes), (*Stochastic processes, Statistical distributions), Sequences, Real numbers, Distribution functions

Several authors studied identically distributed linear forms in independently and identically distributed ramdom variables. J. Marcinkiewicz considered finite or infinite linear forms and assumed that the random variables have finite moments of all orders. He showed that the common distribution of the random variables is then the Normal distribution. Yu. V. Linnik obtained some deep results concerning identically distributed linear forms involving only a finite number of random variables. The authors have investigated in a separate paper the case where one of the linear forms contains infinitely many terms while the other is a monomial. They obtained a characterization of the normal distribution under the assumption that the second moment of the random variable is finite. In the present paper the authors investigate a similar problem and do not assume the existence of the second moment. (Author)

AD-626 399 Fld. 12/1
NORTH CAROLINA UNIV CHAPEL HILL
DERIVATION OF A CLASS OF FREQUENCY DISTRIBUTIONS VIA BAYES'S THEOREM.
Revised ed.,
by Carl-Erik Sarndal. Mar 65, 12p. Contract DA-ARO (D)-31-124-G670 AROD 4967:6

Unclassified report

Revision of manuscript submitted Nov 64.

Availability: Published in The Journal of the Royal Statistical Society. Series B (Methodological) v27 n2 p290-300 1965. Copies to DDC users only.

Descriptors: (*Statistical distributions, Theorems), (*Theorems, Statistical distributions), Probability, Distribution theory

Being in some respects expository in character, this paper uses Bayes's theorem to derive a k-variate discrete probability distribution which is fundamental inasmuch as it proliferates, under various sets of asymptotic conditions, to yield as its limiting forms an array of other k-variate distributions including the multinomial, independent Poisson, independent negative binomial, independent gamma, Dirichlet and multivariate normal. A systematic arrangement of these distributions thereby suggests itself, and a number of properties pertaining to the distributions are discussed within the framework created by this arrangement. (Author)

AD-626 401 Fld. 12/1
NORTH CAROLINA UNIV CHAPEL HILL
CYCLIC DESIGNS,
by H. A. Davidd, and F. W. Wolock. 18 Jan 65, 10p. Contract DA-ARO (D)-31-124-G670 AROD 4967:5

Unclassified report

Availability: Published in The Annals of Mathematical Statistics v36 n5 p1526-34 Oct 1965. Copies to DDC users only.

Descriptors: (*Combinatorial analysis, Set theory), Experimental design, Groups (Mathematics)

AD-626 485 Fld. 12/1
JOHNS HOPKINS UNIV BALTIMORE MD
GEODESIC PARALLEL COORDINATES IN THE LARGE,
by Wei-Liang Chow, Philip Hartman, Gilbert A. Huntand , and G. D. Mostow. 10 Feb 64, 27p. Contract AF-AFOSR-62-45 Proj. AF-9749 Task 974902
AFOSR 65-1796

Unclassified report

Prepared in cooperation with Cornell Univ., Ithaca, N. Y. and Yale Univ., New Haven, Conn.

Availability: Published in American Journal of Mathematics v86 n4 p705-27 Oct 1964. Copies to DDC users only.

Descriptors: (*Measure theory, Surfaces), (*Curved profiles, Measure theory), Differential geometry, Complex variables, Inequalities, Mapping (Transformations)

Let M be a 2-dimensional manifold with a Riemannian metric, C a jordan curve on M, g (r) the set of points on M a distance r from C, and L (r) the length of the curve g (r). It is first noted that even in the euclidean plane with C a C (infinity) curve, the function L (r) need not be continuous. However, under very mild differentiability conditions, L (r) is shown defined and well behaved outside of at most a closed set of r-values of Lebesque measure zero. Various inequalities used formerly by Fiala and Ahlfors are shown valid, even taking into account the exceptional set and the possible discontinuities of L. Several results are given on isoperimetric inequalities and related equations. (Author)

AD-626 499 Fld. 12/1
CATHOLIC UNIV OF AMERICA WASHINGTON D C
ON TUBE STATISTICS AND CHARACTERIZATION PROBLEMS,
by Eugene Lukacs. 1 Dec 61, 11p. Contract AF-AFOSR-61-32 ,NSF-G-9968

Unclassified report

Availability: Published in Z. Wahrscheinlichkeitstheorie, V1 p116-25 1962. Copies to DDC users only.

Descriptors: (*Statistical distributions, Distribution theory), Distribution functions, Matrix algebra, Population (Mathematics)

AD-626 505 Fld. 12/1
CALIFORNIA UNIV LOS ANGELES
MINIMAX DESIGNS IN TWO DIMENSIONAL REGRESSION.
Revised ed.,
by Paul G. Hoel. 1 Feb 65, 10p. Contract AF-AFOSR-459-63 Proj. AF-9749 Task 974902
AFOSR 65-1964

Unclassified report

Availability: Published in The Annals of Mathematical Statistics v36 n4 p1097-1106 Aug 1965. Copies to DDC users only.

Descriptors: (*Analysis of variance, Minimax technique), (*Minimax technique, Analysis of variance), Polynomials, Optimization, Functions, Trigonometry

The problem is studied of how to space observations in regression so as to minimize the variance of an estimate of the regression function value at an arbitrary point in the domain of observations. Necessary and sufficient conditions are obtained for such a design, called a minimax design, in two dimensional polynomial regression of the type in which the regression function possesses a product structure. Such conditions are also obtained for minimax designs in one dimensional trigonometric and two dimensional spherical harmonics regression. Particular designs of the latter type are constructed. (Author)

AD-626 509 Fld. 12/1
CALIFORNIA UNIV RIVERSIDE
BOUNDED GENERALIZED ANALYTIC FUNCTIONS ON THE TORUS,
by Victor L. Shapiro. 8 Oct 63, 13p. Contract AF-AFOSR-351-63 Proj. AF-9749 Task 974902
AFOSR 65-1797

Unclassified report

Availability: Published in Pacific Journal of Mathematics, v14 n4 p1413-22 1964. Copies to DDC users only.

Descriptors: (*Functions, Topology), (*Topology, Bodies of revolution), Taylor's series, Fourier analysis

AD-626 550 Fld. 12/1
CALIFORNIA UNIV LOS ANGELES
LINDELOFIAN MEROMORPHIC FUNCTIONS,
by K. V. Rajeswararao. 24 Sep 62, 5p. Contract DA-ARO (D)-31-124-G40
AROD 1517:82

Unclassified report

Availability: Published in Proceedings of the American Mathematical Society v15 n1 p109-113 Feb 1964. Copies to DDC users only.

Descriptors: (*Functions, Conformal mapping), (*Conformal mapping, Functions), Theorems, Complex variables, Potential theory

AD-626 551 Fld. 12/1
CALIFORNIA UNIV LOS ANGELES
REMARKS ON THE CLASSIFICATION OF RIEMANN SURFACES.
Revised ed.,
by K. V. Rajeswara Rao. 25 Mar 63, 4p. Contract DA-ARO (D)-31-124-G40
AROD 1517:46

Unclassified report

Revision of manuscript submitted 22 Jan 1963.

Availability: Published in Proceedings of the American Mathematical Society v15 n4 p632-4 Aug 1964. Copies to DDC users only.

Descriptors: (*Complex variables, Conformal mapping), (*Conformal mapping, Complex variables), Functions, Potential theory, Boundary value problems

AD-626 560 Fld. 12/1
CALIFORNIA UNIV BERKELEY
CONDITIONAL EXPECTATIONS OF RANDOM VARIABLES WITHOUT EXPECTATIONS.
Technical rept.,
by R. E. Strauch. 19 Mar 65, 5p. Contract Nonr-222 (43) Proj. NR-042-036
ONR 66

Unclassified report

Availability: Published in The Annals of Mathematical Statistics v36 n5 p1556-9 Oct 1965. Copies to DDC users only.

Descriptors: (*Probability, Analysis of variance), Measure theory, Distribution theory

AD-626 603 Fld. 12/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SUFFICIENCY OF THE TERMINAL DECISION IN A SPRT,
by J. J. Bussgang, and M. B. Marcus. Jan 66, 7p.
Rept. no. P-3291

Unclassified report

Prepared in cooperation with Signatron, Inc., Lexington, Mass.

Descriptors: (*Sequential analysis, Decision theory), Stochastic processes, Statistical tests, Probability

Consider a situation in which an experimenter observes a stochastic process starting at time t = 0. A continuous sequential test of simple hypotheses concerning the underlying distribution of the process is performed and terminates at some time t = or > zero. At termination, a choice is made between the alternate hypotheses in accordance with the test procedure. The test procedure is designed to produce this choice within specified probabilities of error. The experimenter may, however, be concerned whether he can also utilize his knowledge of the test duration of the particular test he performed in order to increase his knowledge about the underlying distribution of the process. The results of this paper demonstrate that for a sequential probability ratio test (SPRT) he can not. In fact the terminal decision and the test duration provide no more information than the terminal decision alone.

AD-625 698 See Fld. 20/10

AD-625 699 See Fld. 20/10

AD-625 948 See Fld. 9/1

AD-625 962 See Fld. 20/10

AD-625 963 See Fld. 20/10

AD-626 093 See Fld. 20/10

AD-626 123 See Fld. 20/2

AD-626 215 See Fld. 20/3

AD-626 300 See Fld. 9/1

AD-626 501 See Fld. 7/4

AD-626 531 See Fld. 5/10

AD-626 566 See Fld. 9/5

AD-626 594 See Fld. 4/1

12/2. OPERATIONS RESEARCH

AD-625 736 Fld. 12/2
CFSTI Prices: HC $1.00 MF $0.50
MITRE CORP BEDFORD MASS
TRADE-OFFS BETWEEN PARTS OF THE OBJECTIVE FUNCTION OF A LINEAR PROGRAM,
by Hans C. Joksch. Dec 65, 17p. Rept. no. W-07454
Contract AF19 (628)-2390 Proj. AF-7070
ESD TR-65-363

Unclassified report

Descriptors: (*Linear programming, Optimization), Transformations (Mathematics), Functions

Linear programs whose objective function can be separated into two parts are considered. The following problem is studied: given an optimal solution with respect to the total objective function, how does it have to be modified to change one part of the objective function by a certain amount and affect the other part as little as possible. The construction of an optimal simplex-tableau for the modified problem from the optimal simplextableau of the original problem is demonstrated. This can serve as a starting tableau for an ordinary parametric programming procedure. The marginal exchange ratio for both parts of the objective function and the simplexmultipliers for the constraints are derived. (Author)

AD-626 395 Fld. 12/2
CALIFORNIA UNIV LOS ANGELES DEPT OF MATHEMATICS
ON VARIATIONAL THEORY AND OPTIMAL CONTROL THEORY.
Revised ed.,
by Magnus R. Hestenes. 4 Dec 64, 26p. Contract DA-31-124-ARO (D)-355
AROD 5863:2
Unclassified report

Revision of manuscript submitted 14 Sep 64.

Availability: Published in J.SIAM Control (SerA) v3 n1 p23-48 1965. Copies to DDC users only.

Descriptors: (*Calculus of variations, Control), (*Optimization, Control), (*Control, Theory), Control systems

AD-626 486 Fld. 12/2
CFSTI Prices: HC $1.00 MF $0.50
TEXAS A AND M UNIV COLLEGE STATION
A STATISTICAL THEORY FOR THE PERT CRITICAL PATH ANALYSIS.
by H. O. Hartley, and A. W. Wortham. 1965, 21p. Contract DA-31-124-ARO (D)-282 Proj. DA-20014501B14C
AROD 4721:2
Unclassified report

Descriptors: (*Operations research, Management engineering), (*Statistical analysis, Operations research), Networks, Time, Numerical analysis, Integration, Monte Carlo method, Approximation (Mathematics)

Technical improvement in PERT Critical Path Methodology is discussed. The approach utilizes the following devices: (a) A classification of networks into different types depending on their degree of involvement and complexity; (b) An operational calculus by which the distribution of critical times will be derived by numerical analysis, notably numerical integration. This method will provide the solution to the problem for the basic types of networks; (c) A Monte Carlo procedure providing an approximate solution for the more involved networks; (d) Analytic solutions for particularly simple networks and particularly simple distributions of completion times. These are mainly used for illustration purposes. (Author)

AD-626 510 Fld. 12/2
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
AN OPTIMAL CONTROL PROBLEM WITH STATE VECTOR MEASUREMENT ERRORS,
by Peter R. Schultz. 1964, 48p. Contract AF-AFOSR-62-68 Proj. AF-9749 Task 974901
AFOSR 65-1001
Unclassified report

Availability: Published in Advances in Control Systems, Theory and Application p197-243 1964. Copies to DDC users only.

Descriptors: (*Optimization, Control), (*Control, Optimization), (*Dynamic programming, Control), Matrix algebra, Differential equations, Stochastic processes, Errors

A discussion is presented of a specific stochastic optimal control problem. The problem is stated as follows: given a system whose behavior is described by the vector matrix differential equation $dx/dt = A(t)x(t) + B(t)u(t) + N(t)$ or by the equivalent stochastic differential equation $dx(t, t+h) = A(t)x(t)h + B(t)u(t,x(t) + z(t)h + dN(t, t+h) + 0(h)$; find the policy $u(t,x(t) + z(t))$ from all piecewise continuous linear functions of $x(t) + z(t)$ which minimizes the performance criterion. The method of dynamic programming developed by Bellman, (Dynamic Programming, Princeton, Princeton U. Press, 1957), is used to obtain the solution. (Author)

AD-626 604 Fld. 12/2, 15/5
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
DISCRETE OPTIMIZATION VIA MARGINAL ANALYSIS,
by Bennett Fox. Jan 66, 16p. Rept. no. P-3288
Unclassified report

Descriptors: (*Procurement, Optimization), (*Optimization, Procurement), Military procurement, Numerical analysis, Operations research

Discrete optimization subject to one contraint is attacked by Lagrangian analysis. Incremental allocation schemes are given that generate undominated allocations. In an important special case, the complete family of undominated allocations is generated. (Author)

AD-626 204 See Fld. 9/2

AD-626 318 See Fld. 12/1

AD-626 449 See Fld. 9/1

AD-626 450 See Fld. 9/5

13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

AD-625 664 Fld. 13/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR VA
ABSOLUTE SPECTRAL DISTRIBUTION MEASUREMENTS OF XENON HIGH-PRESSURE DISCHARGES.
Final rept. Mar-May 63,
by Dietrich Fromm. Nov 65, 23p. Rept. no. 1837
Task 1D010501A01309
Unclassified report

Descriptors: (*Xenon, Electric arcs), (*Light Sources), (*Spectra (Visible + ultraviolet), Lighting equipment), Illumination, Brightness, Military requirements

The report covers the work conducted to obtain in absolute units the spectral distribution of a 10-kilowatt, xenon, compact arc lamp. The wavelength range of these measurements was selected between 2,400 and 11,000 Angstroms (A) at four different power levels: 2.6, 5, 7.5, and 10 kilowatts. The results were obtained in absolute units of radiance: watts/ (steradian) (sq cm) (1 A interval). The report concludes that: (1) The highest radiance was between 800 and 900 millimicrons. (2) The blackbody temperature producing the same radiance at 0.8232 micron as on the xenon spectrum was 9775K. (3) The connection between total radiated energy from 0.2 micron and 1.1 microns and lamp power is, within the measured range, almost linear. (4) With increasing lamp power, increased line broadening and continuum appear as is to be expected. (Author)

AD-626 478 Fld. 13/1
CFSTI Prices: HC $2.00 MF $0.50
AIR PREHEATER CO INC WELLSVILLE N Y
INVESTIGATE ADVANCED HEAT EXCHANGER DESIGNS OF COMPACT HEAT EXCHANGERS WHEN OPERATING IN A MARINE ENVIRONMENT.
Quarterly progress rept. no. Q2, 26 Sep-31 Dec 65,
by Henry H. Osborn. 13 Jan 66, 34p. Contract NObs-92559 Proj. SF013-06-14 Task 3890
Unclassified report

Descriptors: (*Heat exchangers, Heat transfer), Wind tunnels, Turbulence, Friction, Sheets, Flow visualization, Metal plates, Environmental tests

The effect of turbulence and wakes on heat transfer and flow friction characteristics of flat and perforated plates are to be investigated. This progress report describes the test apparatus, flow visualization methods, turbulence generator description, a summary of analytical work performed to date and, a bibliography of related work. (Author)

AD-626 048 See Fld. 9/5

13/2. CIVIL ENGINEERING

AD-626 244 Fld. 13/2, 5/3
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
THE DEVELOPMENT OF THE PRODUCTIVE FORCES IN THE ECONOMIC REGIONS OF THE USSR. (THE PROBLEM OF DEVELOPING SMALL CITIES AND RESTRICTING THE GROWTH OF LARGE CITIES),
by V. Sh. Dzhashvili. 1965, 9p. Rept. no. ACSI-I-8462-A
TT 66-60202
Unclassified report

(Razvitie Proizvoditelnykh Sil v Ekonomicheskikh Raionakh SSSR (K Probleme Razvitiya Gorodskikh Poselenii i Organicheniya Rost Krupnykh)) Trans. from Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n2 1964.

Descriptors: (*Economics, USSR), (*Urban planning, Economics), Urban areas, Population, Labor, Industrial production

AD-626 252 Fld. 13/2
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
UL'YANOVSK UNDER CONSTRUCTION (UL'YANOVSK STROITSYA),
by A. Brosman, and N. Kashkadamova. 1965, 2p. Rept. no. ACSI-I-8558
TT 66-60210
Unclassified report

Trans. from Na Stroikakh Rossii (USSR) v6 1965.

Descriptors: (*Urban planning, USSR), Urban areas, Industrial plants, Construction, Transportation, Commerce

AD-626 462 Fld. 13/2, 8/6
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
WATER SUPPLY AND SEWAGE DISPOSAL DEVELOPMENTS IN THE FAR NORTH,
by William L. Boyd, and Josephine W. Boyd. 1965, 13p. Contract Nonr-1138 (01) ,Nonr-3996 (01) Proj. NR-307-105
Unclassified report

Availability: Published in Journal American Water Works Association v57 n7 p858-68 Jul 1965. Copies to DDC users only.

Descriptors: (*Arctic regions, Sanitary engineering), (*Water supplies, Artic regions), (*Sewage, Disposal), Wastes (Sanitary engineering), Containers, Toilet facilities, Processing, Sea water

AD-625 842 See Fld. 6/5

AD-625 942 See Fld. 8/13

AD-626 151 See Fld. 8/8

AD-626 272 See Fld. 8/2

AD-626 318 See Fld. 12/1

AD-626 378 See Fld. 8/13

13/3. CONSTRUCTION EQUIPMENT, MATERIALS AND SUPPLIES

AD-625 856 Fld. 13/3, 13/6
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
EQUIPMENT FOR THE MECHANIZATION OF LOADING UNLOADING WORK,
by E. Levin. Oct 64, 10p. Rept. no. FSTC-381-T64-4
Proj. FSTC-G7-1050
TT 66-60159

Unclassified report

Trans. of Sovetskaya Torgoviya (USSR) p37-40 Sep 1963.

Descriptors: (*Industrial equipment, Handling), (*Handling, Industrial equipment), Cranes, Fork-lift vehicles, Hoists, Positioning devices (Machinery), Logistics, USSR

AD-626 064 Fld. 13/3, 13/7, 13/8, 13/6
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
STATUS AND PROSPECTS FOR THE DEVELOPMENT OF HANDLING EQUIPMENT.
Dec 65, 14p. Rept. no. FSTC-381-T65-557
TT 66-60183

Unclassified report

Trans. of mono. Mekhanizatsiya PogruzochnoRazgruzochnyk
h i Skladskikh Rabot, Moscow, 1963 p267-77.

Descriptors: (*Handling, Industrial equipment), (*Industrial equipment, Handling), USSR, Hoists, Fork-lift vehicles, Pneumatic systems, Conveyors, Positioning devices (Machinery), Warehouses, Economics

13/4. CONTAINERS AND PACKAGING

AD-625 717 Fld. 13/4, 9/1, 19/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB CORONA CALIF
STRUCTURAL MATERIAL DAMPING FOR PACKAGING ELECTRONIC COMPONENTS. TECHNIQUES USED FOR MISSILE FUZE COMPONENTS CAN BE ADAPTED FOR MANY PACKAGING APPLICATION,
by J. L. Day. 1 Dec 65, 32p. Task RMMO-21-030/211-1/F009-08-01
NAVWEPS 8810

Unclassified report

Descriptors: (*Vibration isolators, Guide missile fuzes), (*Electronic equipment, Vibration isolators), Damping, Resonance frequency, Packaging, Environmental tests, Acceleration, Shock resistance, Temperature, Humidity, Salt spray tests, Aluminum, Castings, Laminates, Glass textiles, Honeycomb cores, Structures, Viscoelasticity, Vibration

Viscoelastic shear damping is being used to control the mechanical resonances of structures housing guided missile fuze components. Four experimental structures were fabricated using cast aluminum, laminated aluminum, laminated fiberglass, and aluminum honeycomb. They were subjected to acceleration, shock, temperature and humidity, and salt-spray tests. This report describes the housings and presents tests results. (Author)

13/6. GROUND TRANSPORTATION EQUIPMENT

AD-625 856 **See Fld. 13/3**

AD-625 928 **See Fld. 11/7**

AD-626 064 **See Fld. 13/3**

AD-626 618 **See Fld. 17/2**

13/7. HYDRAULIC AND PNEUMATIC EQUIPMENT

AD-625 729 Fld. 13/7
CFSTI Prices: HC $4.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS LAB
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
Progress rept. no. 2, 1 Feb-31 May 65,
by S.-Y. Lee, H. H. Richardson, S. E. Goldstein, R. J. Gurski, and D. N. Wormley. Sep 65, 117p. Rept. no. DSR-5393-2
Contract AF33 (615)-2210 Proj. AF-8226 Task 822604
AFFDL TR-65-180

Unclassified report

Continuation of Contracts AF33 (616)-6120, AF33 (657)7535. See also AD-624 885.

Descriptors: (*Fluid flow, Control systems), (*Power, Pneumatic systems), Aerospace craft, Jets, Electric discharges, Servomechanisms, Vortices, Fluid amplifiers

The report presents technical results and describes progress in several phases of continuing applied research and development related to the design and development of high-performance fluid control devices for advanced aerospace systems. Emphasis continues to be placed on pneumatic components and systems which are capable of performing, with high reliability, over wide ranges of temperature and in the presence of intense radiation. The report describes current work dealing with a pulselength modulated gas servo, the dynamics of fluid jet modulators, fluid jet modulation by electric spark discharge, electrostatic fluid jet modulation, vortex valve characteristics, jet-pipe inlet coupling, the transmission characteristics of flexible fluid-carrying tubes, and a bi-fluid pneumatic transformer. (Author)

AD-625 885 Fld. 13/7
CFSTI Prices: HC $5.00 MF $1.00
HARRY DIAMOND LABS WASHINGTON D C
FLUERICS (FLUID AMPLIFICATION). 16. A BIBLIOGRAPHY.
30 Aug 65, 158p. Rept. no. TR-1304
Proj. DA-1P010501A001 ,HDL-31100

Unclassified report

Descriptors: (*Fluid amplifiers, Bibliographies), (*Bibliographies, Fluid amplifiers), Control systems, Fluid flow, Turbulence, Transducers, Instrumentation, Flow visualization, Computer logic, Jets, Vortices, Pipes, Diffusers, Vibration, Patents, Acoustics, Abstracts

A bibliography of flueric (fluid amplifier) devices and theory is presented with abstracts for the majority. The bibliography includes 376 titles on fluid devices, fluid circuits, sensors and transducers, instrumentation and flow visualization, fabrication, patents and disclosures, and other directly applicable technology. It also includes titles on related topics such as jets; vortex flow; pipes, passages, and diffusers; and vibration and acoustic effects. (Author)

AD-626 064 **See Fld. 13/3**

13/8. INDUSTRIAL PROCESSES

AD-625 718 Fld. 13/8
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS MATERIALS ENGINEERING DIV
SOLID-STATE PRESSURE BONDING OF TITANIUM ALLOY 6AL-6V-2SN.
Technical rept.,
by Robert Fitzpatrick, Robert M. Colton, Warren C.Malatesta, and F. J. Rizzitano. Dec 64, 16p.
Proj. DA-TN-2-8051
AMRA TR-64-48

Unclassified report

Descriptors: (*Titanium alloys, Welding), (*Welding, Titanium alloys), Tin alloys, Vanadium alloys, Bonding, Pressure, Welds, Thermal joining, Mechanical properties, Weapon systems, Microstructure, Toughness, Pipes

High-strength titanium assemblies for Army weapon systems have been fabricated using solid-state bonding and controlled plastic deformation techniques to achieve union between individual components. For this application coalescence is induced by heating the metal about the abutting interface area between units to a temperature slightly above that of the beta transus of the alloy. At this temperature, diffusion and grain growth occur across the interfaces of abutting components producing the desired solid-state bond. During postweld cooling of the bonded area through the two-phase alpha-beta region of the alloy, plastic deformation is initiated and completed at the weld area. This action refines any grains that recrystallized during the heating cycle and disperses any oxide inclusions which may have been trapped within the bond area. The final microstructure developed at the bond is typical of a wrought material and exhibits a definite grain-flow pattern throughout. It is indicated that alpha-beta titanium can be pressure-bonded to a strength and toughness approximately equal to the base material. (Author)

AD-625 776 Fld. 13/8
CFSTI Prices: HC $2.00 MF $0.50
LITTON SYSTEMS INC MINNEAPOLIS MINN APPLIED SCIENCE DIV
SPUTTERING.
Annual rept. 1 Nov 64-31 Oct 65,
by R. V. Stuart, and G. K. Wehner. Nov 65, 46p. Rept. no. LSI-2926
Contract Nonr-1589 (15) Proj. 85037

Unclassified report

Descriptors: (*Sputtering, Atomic energy levels), Ion bombardment, Ejection, Atoms, Energy, Doppler effect

Measurement of the Doppler shift of light emitted in the direction of travel by sputtered Mo and Ag atoms have verified time-of-flight measurements of ejection energies of sputtered atoms. The Doppler shift measurements, being dependent on the distribution of energies of sputtered atoms, provide much stronger substantiation of time-of-flight data than that provided by agreement with average ejection energy measurements. The Doppler shift measurements have substantiated not only numerical values of ejection energies but also the shape of the distribution function. The dependence of the high energy tail on bombarding ion energy and the lack of dependence of the most probable ejection energy on bombarding ion energy are also verified by the Doppler shift measurements. (Author)

AD-625 886 Fld. 13/8
CFSTI Prices: HC $1.00 MF $0.50
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J STATISTICS CENTER
CHAIN SAMPLING INSPECTION PLANS-CHSP-0,3 AND CHSP-1,3.
Technical rept.,
by K. S. Stephens, and H. F. Dodge. Dec 65, 21p. Rept. no. TR-N-22
Contract Nonr-404 (18) Proj. RR-003-05-01, NR-042-241

Unclassified report

See also AD-616 751.

Descriptors: (*Quality control, Statistical analysis), (*Statistical analysis, Quality control), (*Sampling, Quality control), Stochastic processes, Matrix algebra, Operations research, Acceptability

This report extends the evaluation and presentation of the statistical properties of 'two-stage' chain sampling inspection plans to pairs of acceptance numbers of 0,3 and 1,3; plans with acceptance numbers of 0,2; 1,2; and 0,1 are covered in earlier reports. Included are a number of Markov Chains used in the evaluation of the operating characteristics. Also included is a brief discussion of the comparison between chain and single sampling plans. (Author)

AD-626 066 Fld. 13/8, 11/9, 11/4
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
APPLICATION OF HIGH-FREQUENCY HEATING IN THE BONDING OF GLASS-REINFORCED PLASTICS,
by L. M. Kovalchuk. Dec 65, 11p. Rept. no. FSTC-381-T65-606
TT 66-60185

Unclassified report

Trans. of Plasticheskie Massy (USSR) n3 1965.

Descriptors: (*Bonding, Plastics), (*Plastics, Bonding), USSR, Glass textiles, Reinforcing materials, Heating, Aging (Materials), Adhesives, Polyester plastics, Bonded joints

High frequency bonding is economically justified only with mass production. As a general rule, this form of bonding is not recommended for small lot production. (Author)

AD-626 190 Fld. 13/8
CFSTI Prices: HC $1.00 MF $0.50
MARTIN CO DENVER COLO
CENTER FOR HIGH ENERGY RATE FORMING PROCESSES.
Quarterly technical progress rept. issue no. 2. 1 Jan 66, 10p. Rept. no. Martin-CR-65-77

Unclassified report

Descriptors: (*Explosive forming, Metals), (*Metals, Explosive forming), Reviews, Hardening, Shock (Mechanics), Strain (Mechanics), Aluminum alloys, Alluminum, Copper, Nickel, Iron, Steel, Titanium, Niobium, Tantalum, Mathematical models

The survey and collection of relevant literature was continued at an accelerated pace due to the addition of personnel to this program. The cataloguing and crossindexing of the documents collected to date is well under way, and the document library has been established within the Science Library at the University of Denver. A method for investigating the microstructural aspects of shock hardening in metals was initiated during this report period. This technique involves electron microscope investigations of thin specimens produced by electropolishing techniques. The initial efforts to prepare thin specimens of 2014 aluminum met with limited success. Additional development will be required to produce a routine technique for sample preparation.

AD-626 376 Fld. 13/8, 11/6, 20/11
CFSTI Prices: HC $2.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
INVESTIGATION OF FRACTURE IN CONNECTION WITH HOT DEFORMATION PROCESSING OF METALS.
Final rept.,
by Nicholas J. Grant, Peter Bridenbaugh, Barry Greeneand , and Robert Kane. Sep 65, 34p. Contract NOw-65-0106-d Proj. WR-007-09-01

Unclassified report

Descriptors: (*Fracture (Mechanics), Hot working), (*Hot working, Fracture (Mechanics)), Deformation, Metals, Nickel alloys

Metals and alloys are normally hot worked at temperatures of 0.6 to 0.95 of their melting temperatures, in degrees Absolute, and at strain rates which may vary from as little as 0.1 to 10,000%/sec. Metals fail in tension, and are subject to tension forces in essentially all hot working operations at some stage of the working process. In the past, no one test method has been developed which encompasses these strain rates at these temperatures as a measure of hot plasticity. Recently a machine was developed which is capable of such performance, without suffering either from overstressing on loading or from impact. Three classes of materials were selected for study: (1) Udimet 700: a casting, semi-forgeable nickel-base superalloy. (2) Molybdenum and molybdenum alloy TZC: body-centered-cubic materials, single and multi-phase materials, respectively, at hot working temperatures. (3) Iron and titanium, and their alloys: to provide materials undergoing a phase transformation, and thereby to permit comparison of atomic packing on hot plasticity; also to permit hot working of two-phase alloys in which both phases are ductile.

AD-626 583 Fld. 13/8, 11/6, 20/11
CFSTI PricesMF $0.50
ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING
EFFECT OF GEOMETRY ON BEND TEST PROPERTIES OF BEAD-ON-PLATE WELDS.
Rept. on Welding Tests on Structural and Rail Steel,
by L. A. Harris, and R. B. Matthiesen. 30 Jun 53, 45p. Contract DA-33-017-eng-180

Unclassified report

Availability: Hard copy available from Ohio River Div. Labs., Mariemont, Ohio, $1.00.

Descriptors: (*Welds, Loading (Mechanics)), (*Loading (Mechanics), Welds), Steel, Metal plates, Bending, Ductility, Deflection, Tests, Stresses

An investigation was made to determine, quantitatively, the effect of the weld reinforcement on the bend test properties of bead-on-plate welds, and verify the method of interpretation based on a comparison of the weld bend test properties rated according to the properties of a notched plate without a weld.

AD-626 584 Fld. 13/8, 11/12
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
A NEW METHOD FOR THE ANALYSIS OF VOLATILE CORROSION INHIBITED PAPER.
Technical rept.,
by Peter Martin,Jr.. Nov 65, 25p. Proj. DA-1C024401A109
RIA 65-3105

Unclassified report

Descriptors: (*Corrosion inhibition, Paper), (*Paper, Corrosion inhibition), Analysis, Test methods, Packaging, Corrosion, Steel, Ammonium compounds, Nitrites, Sodium compounds, Reliability, Storage

The method utilized a commercial instrument, the Corrater, which measures instantaneous corrosion rates in a conducting media. Laboratory and field tests were conducted on new and used VCI paper to establish the reliability and accuracy of the method. The VCI papers were analyzed by adding a paper sample to the salt solution, stirring to remove the VCI, and noting the decrease in the corrosion rate. The decrease in the corrosion rate was converted to weight of loading (grams per square foot) by means of the standard curves previously prepared. The results obtained compared favorably with results obtained by other more tedious analytical methods. The method developed has the following advantages: utilizes a stable reagent, nontechnical personnel can conduct the test, the instrument is battery operated and the test time is less than one hour.

AD-626 599 Fld. 13/8, 20/11, 11/6
CFSTI PricesMF $0.75
ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING
THE FATIGUE PROPERTIES OF WELD METAL,
by R. B. Matthiesen, and L. A. Harris. 30 Jun 53, 72p. Contract DA-33-017-eng-180

Unclassified report

Availability: Ohio River Div. Labs., Mariemont, Ohio, HC$1.00, CFSTI MF$0.75.

Descriptors: (*Welds, Fatigue (Mechanics)), (*Fatigue (Mechanics), Welds), Steel, Welding rods, Fracture (Mechanics), Hydrogen embrittlement, Tensile properties, Stresses, Metal plates

An investigation was made to determine and to compare, quantitatively, the fatigue and the static properties of weld metal deposited by a low hydrogen E7016 electrode and by a high cellulose E6010 electrode.

AD-626 601 Fld. 13/8, 11/6
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE
DIRECTIONAL SOLIDIFICATION STUDIES.
Final technical rept.,
by R. F. Polich, G. E. Nereo, and M. C. Flemings. 1964, 79p. Contract DA-19-020-AMC-5753 (Z) Proj. DA-D7-3-20001-06-07-A4-F01
WAL TR-311/60

Unclassified report

Descriptors: (*Steel, Freezing), (*Casting, Steel), Castings, Ductility, Tensile properties, Fatigue (Mechanics), Heat treatment, Impact tests, Cooling

Ductility of AISI 4340 alloy heat treated to 150,000 170,000 psi yield strength level is strongly affected by solidification mode. Reduction in area is doubled in heavy sections (increased from 50 per cent per cent) by control of solidification. Optimum ductility is found in castings with columnar structures. At the 150,000 170,000 psi yield strength level, tensile, yield, and impact strength are relatively insensitive to solidification mode. Ductility of equiaxed structures correlates well with dendrite arm spacing, decreasing with increasing dendrite arm spacing. Ductility of columnar 'unidirectionally solidified' castings is relatively insensitive to dendrite arm spacing. Fatigue strength was significantly affected by solidification structure. The fatigue limit for columnar specimens was in excess of 60,000 psi, with an endurance ratio of 0.36, while for equiaxed specimens fatigue limit was 45,000 psi, with an endurance limit of 0.29. Choice of chill material and use of watercooling for unidirectional solidification depends on casting size and complexity. Watercooled copper chills provide rapid heat transfer but are not necessary for small castings. (Author)

AD-626 602 Fld. 13/8, 14/2
CFSTI Prices: HC $2.00 MF $0.50
SPRINGFIELD ARMORY MASS
HARMONIC ANALYSIS METHOD FOR THE NONDESTRUCTIVE DETERMINATION OF CASE DEPTH OF CARBURIZED STEEL.
Technical rept.,
by K. A. Fowler, and H. P. Hatch. 30 Nov 65, 36p. Rept. no. SA-TR19-1514
Proj. DA-AW-4-05001

Unclassified report

Descriptors: (*Non-destructive testing, Steel), (*Harmonic generators, Non-destruc-

tive testing). (*Steel, Non-destructive testing), Case hardening, Thickness, Determination, Magnetic properties

An investigation concerned with the nondestructive determination of case depth by harmonic voltage analysis measurements was continued. A prototype test instrument was designed and constructed which permits rapid, accurate measurement of the amplitude, phase, and inphase and quadrature components of harmonic frequencies generated by the test piece under the influence of sinusoidal applied field. The design of the instrument is such that a wide range of frequency and strength of applied field can be investigated. It has been established by comparative measurements on homogeneous plain carbon steels that the results obtained by harmonic analysis are primarily produced by the additional surface carbon content achieved by the carburizing process rather than such secondary factors as residual stress or retained austenite. The ability to measure several voltage parameters has also been shown to be of value in effectively separating two simultaneously changing variables, i.e., case depth and tempering temperature. (Author)

AD-625 755 See Fld. 9/1

AD-625 756 See Fld. 9/1

AD-625 781 See Fld. 11/6

A e-625 806 See Fld. 13/10

AD-625 831 See Fld. 9/1

AD-625 890 See Fld. 9/1

AD-625 893 See Fld. 19/6

AD-625 900 See Fld. 11/6

AD-625 950 See Fld. 14/2

AD-626 049 See Fld. 11/1

AD-626 064 See Fld. 13/3

AD-626 181 See Fld. 9/1

AD-626 182 See Fld. 9/1

AD-626 186 See Fld. 11/6

AD-626 212 See Fld. 20/5

AD-626 225 See Fld. 11/6

AD-626 288 See Fld. 20/12

AD-626 289 See Fld. 20/12

AD-626 375 See Fld. 11/9

AD-626 383 See Fld. 9/1

AD-626 419 See Fld. 9/1

AD-626 433 See Fld. 9/1

AD-626 437 See Fld. 9/1

AD-626 443 See Fld. 20/12

AD-626 482 See Fld. 9/1

AD-626 622 See Fld. 11/6

AD-626 628 See Fld. 7/1

13/9. MACHINERY AND TOOLS

AD-625 762 Fld. 13/9, 20/4
CFSTI Prices: HC $1.00 MF $0.50
AMPEX CORP REDWOOD CITY CALIF
INTERACTION BETWEEN SELF-ACTING AND EXTERNALLY PRESSURIZED EFFECTS IN A FOIL BEARING.
Technical rept.,
by E. J. Barlow. Oct 65, 24p. Rept. no. AMPEX-RR-65-12
Contract Nonr-3815 (00) (X) Proj. NR-062-297

Unclassified report

Descriptors: (*Bearings, Lubrication), (*Lubricants, Fluid flow), Numerical analysis, Pressure, Nonlinear systems, Foils

For a foil bearing, the interaction between the flow of lubricant from feed holes and the flow in from the surrounding environment is calculated numerically. The results are applicable for a partial arc foil bearing whenever the feed holes are far from both ends of the wrap angle. The report extends the linearized solution into the nonlinear range. (Author)

AD-625 872 Fld. 13/9
CFSTI Prices: HC $6.00 MF $1.25
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF INDUSTRIAL ENGINEERING
SOURCES AND CONTROL OF MECHANICAL VIBRATIONS AFFECTING MACHINE TOOL PERFORMANCE QUALITY.
Final rept.,
by A. O. Schmidt, Inyong Ham, and A. D. Brickman. Sep 65, 228p. Contract DA-11-070-AMC-628 (W) Proj. PEMA-56209
RIA TR-65-2532

Unclassified report

Descriptors: (*Machine tools, Vibration), Control, Mechanical properties, Performance (Engineering), Sources, Machining, Surface properties

An investigation of the internal and external sources of vibration in machining operations which impair the performance quality of conventional machine tools was conducted. Particular attention was give to the surface finish of workpieces and the deflection of specific machine tool components. A literature survey on machine tool vibrations was abstrated. All experimental work was carried out under such operating conditions as can be found in an average precision machine shop. The measuring instruments used were standard items except in the case of a special surface analyzer.. Sources of mechanical vibrations in machine tools can be determined satisfactorily with limited instrumentation but a thorough understanding of machine tool functions and metal cutting technology is necessary. Forced and self-excited vibrations can occur simultaneously with both having a detrimental effect upon surface finish and dimensions. (Author)

AD-625 911 See Fld. 19/1

AD-626 007 See Fld. 20/11

AD-626 008 See Fld. 20/11

13/10. MARINE ENGINEERING

AD-625 806 Fld. 13/10, 11/6, 13/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
APPLICATION OF EXTRUSION ELEMENTS DURING THE CONSTRUCTION OF SHIPS ON SUBMARINE WINGS (HYDROFOILS),
by B. V. Chubikov. 20 Dec 65, 17p. Rept. no. FTD-TT-65-1883
TT 66-60150

Unclassified report

Unedited rough draft trans. of Sudostroenie (USSR) v31 n3 p26-30 1965.

Descriptors: (*Hydrofoil boats, Construction), (*Aluminum alloys, Ships), Extrusion, USSR, Hydrofoils, Welding, Panels (Structural)

AD-625 812 Fld. 13/10
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
A STUDY OF IMPULSE LOADING AND TRANSIENT ANALYSIS FOR PARAMETER EVALUATION OF SHIP HULLS AND APPENDAGES.
Final rept. 1 Jul 63-21 Jun 64,
by Arthur F. Kilcullen. Nov 65, 42p. Rept. no. 2043
Proj. S-F013-01-03 Task 11274

Unclassified report

Descriptors: (*Ship hulls, Loading (Mechanics)), Vibration, Ship models, Mathematical analysis, Test equipment

Methods of impulse loading applicable to a real ship and the analysis of the corresponding vibrational response are discussed. Instrumentation specifications and results using full-scale ship data are tabulated. Recommendations for development of mechanical impulse devices and electronic transient response analyzers are given. (Author)

AD-625 851 Fld. 13/10, 11/9, 11/4
CFSTI Prices: HC $5.00 MF $1.00
DEPARTMENT OF THE NAVY WASHINGTON D C
TESTING AND CONTROL OF SHIPBUILDING GLASS PLASTICS,
by V. I. Smirnov, and V. V. Meshcheryakov. 1965, 176p. Rept. no. Translation-2048
TT 66-60157

Unclassified report

Trans. of mono. Ispytanie i Kontrol Sudostroitelnykh Stekloplastikov, Leningrad, 1965, 186p.

Descriptors: (*Glass textiles, Reinforcing materials), (*Composite materials, Ship hulls), (*Ship hulls, Composite materials), USSR, Plastics, Quality control, Polyester plastics, Mechanical properties, Physical properties

The purpose of this book is to acquaint the reader with current methods of determining the physical and mechanical properties of structural glass plastics used in building ship hulls, as well as with quality control methods used with glass plastics contained in hull structures and with the inspections made during the building of glass plastic hull structures. (Author)

AD-625 864 Fld. 13/10
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
THE EFFECT OF DISTORTION OF SUB-CAVITATING FOIL CONTOURS ON CAVITATION INCEPTION VELOCITY,
by George P. Moeckel. Oct 65, 38p.

Unclassified report

Descriptors: (*Hydrofoils, Distortion), (*Cavitation, Velocity), Hydrodynamic configurations

The purpose of the paper is to investigate the theoretical effect of distortions on subcavitating foil sections in regard to cavitation inception velocities. The study is intended to give some prediction as to type and size of distortions that may be tolerated in foil construction. It is natural to expect errors in foil shape to occur as a result of inaccurate construction or damage. It is therefore the intention of this paper to provide estimates of admissible deviations from the intended foil geometry in order that cavitation may be prevented or at least anticipated. (Author)

AD-626 035 Fld. 13/10, 20/4
CFSTI Prices: HC $3.00 MF $0.75
VIDYA DIV ITEK CORP PALO ALTO CALIF
INTERFERENCE BETWEEN A HULL AND A STERNMOUNTED DUCTED PROPELLER.

Technical rept. 1 Oct 64-30 Sep 65,
by Anthony R. Kriebel, and Michael R. Mendenhall. 30 Oct 65, 82p. Rept. no. Vidya-204
Contract Nonr-4278 (00) Proj. Vidya-9259 Task 925901

Unclassified report

Descriptors: (*Hulls (Marine), Interference), (*Shrouded propellers, Interference), Hydrodynamics, Axially symmetric flow, Wake, Leading edge, Flow separation, Force (Mechanics), Thrust, Shear stresses

A hydrodynamic analysis was made of an underwater hull and a stern-mounted ducted propeller in steady axially symmetric flow. Singularity distributions are used to represent a typical hull, the hull wake, a thin cambered duct, and the propeller. The propeller is approximated by an actuator disk which adds a uniform velocity to the slipstream. Duct camber lines are chosen to minimize duct leading-edge suction, the hull-duct interference force, and separation of the duct boundary layer. The potential flow field, duct boundary layer, and interference forces are all predicted versus: duct length, duct thrust, duct loading distribution, and Reynolds number. As an aid in the design or selection of an experimental propeller, its inflow, loading, and power are estimated. For the assumed conditions, the computed results show that a long duct (with chord equal to exit diameter) can finally provide only about 7 percent as much net thrust as the propeller before the boundary layer separates from the outer duct surface. One reason for this low value is that about half the duct thrust is lost to duct shear drag. A duct half as long can provide only 6 percent as much net thrust as the propeller before separating. Increasing the Reynolds number based on duct chord from 2,400,000 to 3.2x10 to the 7th power allows only a small increase in duct thrust before separation. It is concluded that relatively little thrust can be carried by ducts of the assumed type without boundary-layer control to delay separation. (Author)

AD-626 185 Fld. 13/10
CFSTI Prices: HC $7.00 MF $1.50
BRAUN (C F) AND CO ALHAMBRA CALIF
STUDY OF HEAT TRANSFER AND FOULING OF HEAT TRANSFER SURFACES IN THE DEEP OCEAN.
Final rept. Jul 64-26 Nov 65.
26 Nov 65, 321p. Contract NBy-32274 Proj. NBy-2650-P

Unclassified report

Descriptors: (*Fouling, Heat exchangers), (*Heat transfer, Underwater equipment), (*Heat exchangers, Fouling), Convection (Heat transfer), Corrosion, Turbulence, Surfaces, Metals, Heat transfer coefficients, Oceans, Deep submergence, Power equipment

Covered both theoretically and by extensive correlated tests are free convection at Rayleigh Numbers above 10 to the 10th power, with varying geometries and radii of curvature of heat rejection surfaces. A design method is developed, with examples of its use, for design of rejection devices for power development in sea water. A prototype was built and tested in Port Hueneme Harbor. The extent of and dissipation of a plume of heated water over the convector are predicted theoretically and correlated with laboratory tests and the harbor tests. Selected materials were exposed for corrosion and marine fouling at shallow water, 300 feet and 4,500 feet deep in the open ocean; heat transfer results were correlated with those predicted theoretically and determined in full scale laboratory experiments. No fouling was observed on heated surfaces at 100, 120 and 140 degrees F, but fouling appeared to be accelerated on non-heated parts of the test apparatus exposed to the warmed water. (Author)

AD-626 323 Fld. 13/10
CFSTI Prices: HC $3.00 MF $0.75
DAVID TAYLOR MODEL BASIN WASHINGTON D C
STRESSES AND MOTIONS OF A LIBERTY SHIP IN RANDOM SEAS,
by John T. Birmingham, and Alfred L. Dinsenbacher. Nov 65, 80p. Rept. no. 2081
Proj. S-F013-03-01 Task 1973

Unclassified report

Descriptors: (*Picket ships, Performance (Engineering)), (*Cargo ships, Performance (Engineering)), Ship hulls, Stresses, Motion, Environmental tests, Water waves, Elasticity

Hull girder stresses and motions were measured while the USS OUTPOST (AGR 10) was operated at selected speeds and relative headings to the waves in the various seas encountered while on ocean station radar picket duty. Forty-nine test runs of about 30-min duration were obtained. Certain amplitude and spectral characteristics of the several quantities measured were examined to observe the effect of ship heading and speed on ship response. Characteristic relationships are given between ship response and wave height and between selected ship responses. Methods used to collect and reduce data are discussed. (Author)

AD-626 439 Fld. 13/10
CFSTI Prices: HC $1.00 MF $0.50
J G ENGINEERING RESEARCH ASSOCIATES BALTIMORE MD
ANALYSIS OF SUBMARINE HULL VIBRATION AND RADIATION AT LOW FREQUENCIES,
Technical rept.,
by Joshua E. Greenspon. Oct 65, 21p. Rept. no. TR-1A
Contract 167-32 ,233X (FBM)

Unclassified report

Descriptors: (*Submarine hulls, Vibration), Ship noise, Underwater sound, Motion, Mathematical analysis, Low frequency

The report explains the use of a new program for computing modes and frequencies of structures with varying mass and stiffness distribution such as submarine hulls. The use of the program in assessing the radiation characteristics of hulls is treated. The use of the modes and frequencies in computing noise radiation to the far field over frequency bands is presented. (Author)

AD-626 479 Fld. 13/10
CFSTI Prices: HC $2.00 MF $0.50
BUREAU D'ANALYSE ET DE RECHERCHE APPLIQUEES BOULOGNE-BILLANCOURT (FRANCE)
ANALOG CALCULATION OF THE HYDRODYNAMIC CHARACTERISTICS OF AN INFINITE SPAN HYDROFOIL SUBMERGED NEAR THE FREE SURFACE.
Final rept.,
by Daniel Fruman. 1960, 32p. Contract N62558-4483 Proj. NR-062-243 ,RR-009-01-01

Unclassified report

Descriptors: (*Hydrofoils, Fluid dynamic properties), Analog systems, Hydrodynamics, Flat plate models, Velocity, Vortices, Lift, France

By means of rheo-electric analogy a method has been developed for determining the hydrodynamic characteristics of an infinite span hydrofoil submerged in a heavy fluid near the free surface. The first part of the work has been limited to study of a flat plate with incidence, but it is shown that the method may be applied to any form of meanline. (Author)

AD-625 847 See Fld. 21/7

AD-626 086 See Fld. 20/4

AD-626 158 See Fld. 20/4

AD-626 372 See Fld. 9/5

AD-626 374 See Fld. 11/6

AD-626 475 See Fld. 20/4

AD-626 588 See Fld. 6/11

13/11. PUMPS, FILTERS, PIPES, TUBING AND VALVES

AD-625 922 Fld. 13/11
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTE OF PAPER CHEMISTRY APPLETON WIS
PRODUCTION AND EVALUATION OF LOWER BASIS WEIGHT IPC 1478 FILTER PAPER.
Final rept. 15 Oct-31 Dec 65,
by D. J. MacLaurin,Jr., Leonard R. Dearth, and J. A. Van den Akker. 31 Dec 65, 12p. Contract AF33 (657)-15562 Proj. VELA-T/6603,AF-2589

Unclassified report

Descriptors: (*Gas filters, Performance (Engineering)), (*Paper, Gas filters), Aerosols, High-altitude, Wind tunnels, Testing, Data

The research was directed toward production and evaluation of IPC 1478 paper of reduced basis weight. It was possible to produce the filter paper at a basis weight of a little over 8 pounds per 1000 sq. ft. which is about 1/4 of the basis weight of the original IPC 1478 paper. The filtration efficiency and flow-pressure drop relationship was determined using the wind tunnel and aerosol detector described in DASA Report No. 1168. The retention of particles by the reduced basis weight paper was appreciably lower than that for the original basis weight IPC 1478 paper, as was expected. The pressure-drop across the reduced basis weight filter at a given flow was also decreased. A portion of the paper produced was impregnated with Kronisol and data were obtained on both the impregnated and unimpregnated paper. The data show that the Kronisol impregnation does not affect the retention or flow-pressure drop characteristics appreciably under the conditions of testing. (Author)

13/12. SAFETY ENGINEERING

AD-625 866 Fld. 13/12, 15/3, 9/2
CFSTI Prices: HC $3.00 MF $0.75
LIN (T Y) AND ASSOCIATES VAN NUYS CALIF
DOCUMENTATION OF COMPUTER PROGRAM FOR EVALUATION OF BUILDING FIRE RESISTANCE.
Final rept.,
by I. R. Stubbs, and K. L. Benuska. Jan 64, 58p. Contract OCD-OS-63-172

Unclassified report

See also AD-625 867.

Descriptors: (*Fire safety, Programming (Computers)), Fire-resistant materials, Buildings, Nuclear warfare, Damage, Civil defense systems, Documentation, Programming languages, Flow charting

AD-625 985 Fld. 13/12, 5/1
CFSTI Prices: HC $3.00 MF $0.75
PUBLIC ADMINISTRATION SERVICE CHICAGO ILL
REPORT ON A REVIEW OF FEDERAL POLICY IN GRANT, LOAN AND CONSTRUCTION PROGRAMS IN AREAS OF HIGH RISK OF NATURAL DISASTER DAMAGE,
by Charles J. Fiss,Jr.. 18 May 65, 61p. Contract OEP-SE-65-5

Unclassified report

Descriptors: (*Disasters, Federal budgets), (*Federal budgets, Disasters), Floods, Tropical cyclones, Earthquakes, Housing, Urban areas, Hazards, Urban planning, Damage, Control, Water supplies, United States Government

The review is directed to problems of federal policy governing programs, primarily of a developmental nature, in areas of high risk of floods, hurricanes, or earthquakes. The original recommendation clearly implied that such policy is remiss in its failure to use the powerful influence of federal loans, grants, and direct construction to avoid placing at risk additional property and more lives in such areas. The review reveals that there is room for improvement in this respect, but also that federal officials in most programs have made some progress toward the objective.

AD-625 867 See Fld. 15/3

AD-626 371 See Fld. 9/2

13/13. STRUCTURAL ENGINEERING

AD-625 732 Fld. 13/13, 8/13
CFSTI Prices: HC $5.00 MF $1.00
UNITED RESEARCH SERVICES CORP BURLINGAME CALIF
EFFECTS OF STRUCTURAL COMPRESSIBILITY ON ACTIVE AND PASSIVE ARCHING IN SOIL-STRUCTURE INTERACTION.
Final rept.,
by Harold G. Mason. Nov 65, 159p. Rept. no. URS-645-8
Contract DA-49-146-XZ-288
DASA 1718

Unclassified report

Descriptors: (*Soil mechanics, Compressive properties), (*Structures, Loading (Mechanics)), (*Underground structures, Loading (Mechanics)), Doors, Stresses, Strain (Mechanics), Equations, Blast, Shelters, Nuclear explosions

The basic theory of static active and passive arching is reviewed, and theoretical relationships describing the effect that structural geometry (length to span) has on the load on the structure, are developed. Equations are developed for passive and active arching for deeply buried idealized compressible cylindrical structures vertically oriented. Linear and nonlinear soil conditions are investigated. Equations are also derived to predict the load (on a trap door) resulting from differential strains occurring between the trap door and the bottom of the soil bin in the deeply buried condition. Both active and passive arching cases and linear and nonlinear soil conditions are considered. A limited experimental program was conducted to investigate the effects of the ratio of the soil to structural compressibility on the load on the structure. Good correlations are shown between the results of this study and the theoretical predictions employing soil parameters measured in normal laboratory soil tests. Similar correlations are also shown between the results of a trap door experimental study and the theoretical predictions. The relationship between rate of loading and the rate of structural response was shown to be a controlling factor in determining whether the loading or unloading stress-strain relationship governs the arching behavior. (Author)

AD-625 752 Fld. 13/13
CFSTI Prices: HC $6.00 MF $1.25
AMMANN AND WHITNEY NEW YORK
ENGINEERING STUDY OF ATOMIC BLAST RESISTANT DESIGN FOR SEVERAL DIFFERENT BUILDING TYPES.
Mar 60, 206p. Contract DA-49-129-eng-317

Unclassified report

Descriptors: (*Buildings, Design), (*Shelters, Design), (*Underground structures, Design), (*Blast, Buildings), Construction, Civil engineering, Radiation damage, Costs, Feasibility studies

The report summarizes the results of an engineering study of several building types to determine (1) the practicability of design for atomic blast resistance, (2) the estimated construction cost for a range of blast pressure loadings and a comparison of costs with conventional construction, and (3) the estimated additional cost of providing personnel shelter areas.

AD-625 753 Fld. 13/13
CFSTI Prices: HC $3.00 MF $1.25
AMMANN AND WHITNEY NEW YORK
ENGINEERING STUDY OF ATOMIC BLAST RESISTANT DESIGN FOR SEVERAL BUILDING TYPES.
Appendix H.
Mar 60, 67p. Contract DA-49-129-ENG-317

Unclassified report

See also AD-625 752.

Descriptors: (*Buildings, Design), (*Shelters, Design), (*Underground structures, Design), (*Blast, Buildings), Construction, Civil engineering

Drawings are given protective construction for administration building; communications building; warehouse; earth-covered concrete igloo, rectangular, doublebarrel arch, and dome; and buried rectangular, doublebarrel arch, dome, and concrete igloo.

AD-625 782 Fld. 13/13
CFSTI Prices: HC $4.00 MF $0.75
ARIZONA UNIV TUCSON ENGINEERING RESEARCH LABS
YIELDING MEMBRANE ELEMENTS IN PROTECTIVE CONSTRUCTION.
Final rept.,
by H. Harrenstein, R. Gunderson, S. Hansen, J. Burnsand , and J. Salmons. 28 May 65, 123p.
Contract OCD-OS-64-187 Proj. OCD-1122D

Unclassified report

Descriptors: (*Shelters, Structural parts), (*Structural parts, Feasibility studies), (*Membranes, Yield point), Steel, Soil mechanics, Blast, Countermeasures

The report covers an investigation of the feasiblity of the application of doubly-curved shell structures to the problem of sheltering people from the blast effects of nuclear weapons. The steel shell works best in tension. Under certain conditions a 1/4 inch thick steel membrane will carry more load than a 19 inch thick concrete slab reinforced with steel at a rate of 4.08 inches per square foot. The membrane itself uses less steel than the reinforced concrete slab. Favorable soil-structure interaction effects are introduced with the yielding membranes. Boundary supports and full scale testing are items that need more attention as parts of future investigation. (Author)

AD-626 226 Fld. 13/13, 20/11
CFSTI Prices: HC $2.00 MF $0.50
ASTROMECHANICS RESEARCH DIV GIANNINI CONTROLS CORP MALVERN PA
STIFFNESS DESCRIBER OF A FILAMENT WOUND CYLINDER FOR DYNAMIC ANALYSES.
Technical rept.,
by Jacob M. Miller. 1965, 48p. Contract AF49 (638)-1509 Proj. AF-9782 Task 978201
AFOSR 65-2214

Unclassified report

Descriptors: (*Filament wound construction, Mathematical models), (*Mathematical models, Filament wound construction), Dynamics, Stiffened cylinders, Matrix algebra, Structural shells

This report presents a technique for assembling a Stiffness Describer for Filament-Wound Cylinders (FWC) in the form of a Stiffness Matrix. The technique described provides the dynamicist with the means to analyze FWC. The data that would be required are physical properties such as: Poisson's Ratio, Moduli of Elasticity and Rigidity for the filament and resin, winding angles of plies, geometric data such as ,cylinder length, radius, overall thickness. The technique described produces a method for representing FWC analogous to that developed for beam-plate complex structures. The derivation of the Stiffness Describer of a FWC entails: writing the load-deflection equations for a shell in matrix form, applying boundary conditions for axial lengths (for assembly purposes), and mathematical modeling of FWC in terms of physical material constants. The expressions used to define structural relationships arose from strain energy considerations for shells and for plies at various angles to the cylinder's axis. The mathematical modeling was based on load paths that occur in composite materials. (Author)

AD-626 589 Fld. 13/13
CFSTI PricesMF $0.75
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
REVIEW OF THE LITERATURE PERTAINING TO THE ANALYSIS OF DEEP BEAMS.
Final technical rept.,
by Gayle E. Albritton. Nov 65, 80p. Rept. no. TR-1-701
Task 13.153

Unclassified report

Availability: U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. HC$1.00, CFSTI MF$0.75.

Descriptors: (*Beams (Structural), Concrete)), (*Concrete, Beams (Structural)), State-of-the-art reviews, Reinforced concrete, Stresses, Bending, Loading (Mechanics), Reinforcing materials

The objective of this study was to define the state of the art pertaining to the design and analysis of both homogeneous and reinforced concrete deep beams. The study was accomplished by reviewing information found in thirty references, i.e. technical journals and reports. Each of the references is summarized, the important conclusions resulting from the study are presented, and recommendations are made as to needs for additional study. (Author)

AD-626 378 See Fld. 8/13

14/1. COST EFFECTIVENESS

AD-625 947 Fld. 14/1
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA RESEARCH AND ENGINEERING SUPPORT DIV
THE CHOICE OF ANALYTICAL TECHNIQUES IN COST-EFFECTIVENESS ANALYSIS.
Research paper,
by Alfred Blumstein. Oct 65, 18p. Rept. no. RP-P-206 ,IDA/HQ-65-4138
Contract SD-50

Unclassified report

Descriptors: (*Cost effectiveness, Analysis), (*Operations research, Cost effectiveness), Model theory, Queueing theory, Game theory, Simulation, Defense systems, Armed forces operations, Optimization

The model is shown to provide a means for determining the measure of effectiveness as a function of the controllable variables in terms of the relevant uncontrollable variables. The various classes of models are characterized as operational exercises, gaming, simulation and analytical, in increasing order of abstraction. These are applicable to different classes of problems: the exercise for last-stage testing of systems, gaming where human decision plays an important role, simulation for complex

problems which are internally describable in complete detail, and analytical models to make use of the power of mathematics, especially where an optimum is sought. (Author)

AD-626 153 Fld. 14/1, 15/5
CFSTI Prices: HC $4.00 MF $1.00
MITRE CORP BEDFORD MASS
ESTIMATING METHODS AND DATA SOURCES USED IN COSTING MILITARY SYSTEMS,
by M. V. Jones. Dec 65, 129p. Rept. no. TM-04263
Contract AF19 (628)-2390 Proj. AF-800C
ESD TDR-65-396

Unclassified report

Descriptors: (*Armed forces supplies, Costs), (*Military facilities, Costs), (*Military personnel, Costs), Armed forces procurement, Armed forces budgets, Analysis, History

The choice of estimating methods and the selection of data sources are two important, closely allied decisions that a cost analyst makes in estimating the costs of a military system. This report discusses five basic estimating methods, examines the advantages and disadvantages of each, and identifies the types of data required to use each method. The 5 methods are (1) per unit catalog price or planning factor, (2) cost-to-cost estimating relationship, (3) noncost-to-cost estimating relationship, (4) specific analogy, and (5) expert estimate.) Two basic data sources, documented historical evidence and projected expert opinion, are discussed as a means of carrying out these estimating methods. The report also briefly reviews existing data base systems that have been organized to make these data sources available to the cost analyst. (Author)

AD-626 087 **See Fld. 15/5**

14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

AD-625 670 Fld. 14/2, 17/1
CFSTI Prices: HC $3.00 MF $0.75
GOODRICH (B F) AEROSPACE AND DEFENSE PRODUCTS AKRON OHIO
DESIGN AND ANALYSIS OF THE HYDROSTATIC TEST FIXTURE FOR THE BOW DOME RUBBER ACOUSTIC WINDOW.
Technical rept.,
by R. H. Bockbrader. 24 Jun 65, 72p. Rept. no. TR-19
Contract NObsr-89483 Proj. SS-041-001 Task 8156

Unclassified report

Descriptors: (*Test facilities, Sonar domes), (*Sonar domes, Test facilities), Hydrostatic pressure, Rubber, Acceptability, Design, Stresses, Structural properties

The report describes the basic conception, design, stress analysis, and use of the hydrostatic test fixture for the Pressurized Rubber Acoustic Window. A test fixture was necessary to determine the acceptability of rubber acoustic windows and the corresponding attachment hardware prior to the subsequent mounting on the ship. This test fixture was designed to test the pressurized rubber acoustic window to an ultimate pressure to 150 psi. Integrated into the test fixture were capabilities for fabricating the port, starboard, and forward splices. The design and fabrication of this fixture consisted of four major components, the basic box structure, the bead seat and bead clamp castings, the master bead fixture, and the seaming fixtures. (Author)

AD-625 712 Fld. 14/2, 5/1, 5/2
CFSTI Prices: HC $2.00 MF $0.75
ARMY BIOLOGICAL LABS FREDERICK MD
BIOLOGICAL LABORATORIES COMMUNICATION,
by George H. Nelson, and Donald M. Hodge.
Dec 65, 81p. Rept. no. Miscellaneous Pub-13

Unclassified report

Descriptors: (*Biological laboratories, Management engineering), Scientific personnel, Social communication, Information retrieval, Sampling, Research program administration

The status of scientific communications was evaluated at the U. S. Army Biological Laboratories through a questionnaire. Two hundred twenty-five responses provided the source information. Evidence indicates a hazy understanding of good communications, a lack of familiarity with the means of good communications, and a lack of recognition of the close interrelationships among information, management, and operations. Generally speaking, participants recognized these characteristics but questioned their own involvement in an information system rather than in their individual interests (operations). The implied placement of responsibility was on information personnel. Several suggestions are made in regard to the future course of Biological Laboratories' information systems. (Author)

AD-625 748 Fld. 14/2, 18/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR X-RAY STRUCTURAL ANALYSIS OF RADIOACTIVE MATERIALS,
by Yu. I. Gribanov, A. G. Karmilov, and I. A. Lednev. 28 Sep 65, 7p. Rept. no. FTD-TT-65-977
TT 66-60130

Unclassified report

Unedited rough draft trans. of Patent (USSR) 155 318 appl. no. 770211/25-8, 23 Mar 62.

Descriptors: (*X-ray diffraction cameras, Modulators), (*Modulators, X-ray diffraction cameras), Materials, Radioactivity, Patents, USSR

A device for X-ray structural analysis of radioactive materials is presented. The device has the distinguishing feature that for the purpose of increasing the precision of the measurement a modulator is provided which accomplished the modulation of the X-ray beam in accordance with a law close the sinusoidal. The modulator is designed in the form of a flat metallic disk eccentrically placed inside of a metallic ring, it is fastened at the point of contiguity in such a way that the geometrical centers are displaced in different directions relative to the axis of rotation of the modulator. The modulator is designed in the form of a disk from material which along the circumference alternates in thickness with a change that depends on the angle of turn in accordance with sinusoidal law.

AD-625 778 Fld. 14/2, 9/5
CFSTI Prices: HC $2.00 MF $0.50
FIELD EMISSION CORP MCMINNVILLE OREG
DESIGN STUDY OF A PHOTOELECTRICAL TRIGGER SYSTEM.
Rept. for 15 Feb-28 May 65,
by Frank M. Collins. Dec 65, 50p. Contract AF29 (601)-6757 Proj. AF-5710,FEC-03-440000 Task 15.020
AFWL TR-65-157

Unclassified report

Descriptors: (*Trigger circuits, Pulse generators), (*Pulse generators, Trigger circuits), Exploding wires, Electric switches, Gas discharges, Sparks, Electric discharges, Power supplies, Design

A moderate-energy pulsed power system discharges 15 Marx-surge pulsers in parallel into an exploding-wire load. The present trigger system, which utilizes a common ultraviolet (uv) light source to irradiate a trigger gap in each pulser, requires operation with the pulser charging voltage set within about 2 percent of self-fire voltage to achieve simultaneous discharge of all pulsers within about = 2 nanoseconds. This degree of synchronism is essential to achieve minimum voltage rise-tim and hence maximum wire temperature. The study describes an improved 'photoelectrical' trigger system successfully developed experimentally, in which a fast-rise voltage trigger pulse is applied to a third electrode in the pulser trigger gap subsequent to uv illumination of the gap. Statistical data have been taken with a single pulser which predict successful triggering of the 15 system pulsers with a discharge simultaneity of about = 1 nanosecond, for a pulser charging voltage of about 10 percent below selffire, while still maintaining original system voltage output, pulse waveform, total delay time, and delay adjustment techniques. The 15 separate trigger pulses required can be derived from the present system uv pulser by addition of a 1:16 coaxial cable transformer. (Author)

AD-625 785 Fld. 14/2, 4/2
CFSTI Prices: HC $4.00 MF $1.00
GOODYEAR AEROSPACE CORP AKRON OHIO
DEVELOPMENT OF BALLUTE FOR RETARDATION OF ARCAS ROCKETSONDES.
Final rept. May 64-Dec 65,
by J. J. Graham,Jr.. Dec 65, 135p. Rept. no. GER-12317
Contract AF19 (628)-4194 Proj. AF-6682 Task 668206
AFCRL 65-877

Unclassified report

Descriptors: (*Meterological instruments, Parachute descents), (*Parachutes, Meterological instruments), (*Balloons, Parachute descents), Deceleration, Atmospheric sounding, Sounding rockets, Parachute fabrics, Polyester plastics, Polyamide plastics, Drop testing, Systems engineering, Flight testing, Radiosondes, Stabilization

A BALLUTE (a) retardation system for Arcas rocketlaunched meteorlogical instruments was investigated. Various BALLUTE configurations were fabricated, tested, and evaluated in four stages: airdock drop tests; low-altitude helicopter drop tests; high-altitude balloonborne drop tests; and rocket-launched flight tests at Cape Kennedy. The program culminated in three successful rocket-launched flights of the final configuration which, because of the high stability of the system, yielded telemetered temperature data of unprecedented quality. The BALLUTE system that meets the design goals of reliability, stability, descent rate, and cost will be made of fractional mil plastic film, will be about 16-1/2 ft in diameter, and will weigh about two pounds. Further development and system qualification testing are recommended prior to incorporation of the BALLUTE into the operational sounding system. (Author)

AD-625 839 Fld. 14/2, 20/4, 7/4
CFSTI Prices: HC $4.00 MF $0.75
OKLAHOMA STATE UNIV STILLWATER
THE MIKER TECHNIQUE.
Doctoral thesis,
by James Edward Bennett. May 65, 125p. Contract AF33 (657)-8767

Unclassified report

See also AD-612 958.

Descriptors: (*Knudsen number, Test methods), (*Vapor pressure, Determination), (*Molecular weight, Determination), (*Vapors, Physical properties), High-temperature research, Balances, Gas flow, Orifices, Quartz, Tin, Force (Mechanics), Calcium compounds, Fluorides, Gold, Graphite, Momentum, Least squares method, Molecular beams

A new momentum recoil technique has been developed for determining the vapor pressure and average molecular weight of the high temperature, low

pressure vapor species. The Microbalance-Inverted Knudsen EffusionRecoil technique (the MIKER technique) employs an inverted Knudsen effusion cell with a diverging conical orifice. The construction of a special vacuum microbalance for the Miker technique is described. The average molecular weight of silver vapor at about 1325K was 62 = 5 (quartz effusion cell) and 73 = 5 (graphite cell). The average molecular weight of tin vapor over the range 1332 - 1504K was 92 = 14. The average molecular weight of calcium fluoride vapor over the range 1521 - 1707K was 77 = 7. The vapor pressure of gold from rate of effusion measurements over the range 1533 - 1673K yields a least squares solution of log P = 7.0184 - 19964/T. Determinations with a sample-blocked orifice yielded an unexpected logarithmic temperature effect on the recoil force. An analysis is presented which corrects for effusion which occurs during the cooling period of the effusion cell.

AD-625 855 Fld. 14/2, 20/6
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS
QUANTITATIVE RADIANT INTENSITY MEASUREMENTS USING PHOTOGRAPHIC AND ELECTRONIC IMAGING,
by Eugene B. Turner. Nov 65, 27p. Rept. no. TDR-469 (5810-73)-1
Contract AF04 (695)-469
BSD TR-65-203

Unclassified report

Descriptors: (*Radiometers, Cameras), (*Cameras, Radiometers), Photographic equipment, Television cameras, Photographic film, Sensitivity, Light, Intensity, Recording systems

The subject of this paper is essentially the use of a camera, either photographic or television, for obtaining quantitative radiometric data. Under some conditions the camera is to be preferred to a device such as a radiometer, and often a camera is the only feasible instrument for making radiometric measurements. For measurements using photographic film it is necessary to consider the film characteristics such as the H and D curve, the spectral sensitivity, etc. The special case of the recording of point images is discussed in detail. For this type of image the diameter of the exposed spot on the film grows with the intensity. This technique, used for over 50 years by astronomers, has a large dynamic range and a fair accuracy. Calibration and data reduction methods are explained. Television systems have several advantages such as real time display, magnetic tape recording, and high sensitivity. Some disadvantages are limted dynamic range and low resolution. References are made to recent papers on the use of vidicon and image-orthicon systems for quantitative measurements. (Author)

AD-625 946 Fld. 14/2
CFSTI Prices: HC $3.00 MF $0.75
HARRY DIAMOND LABS WASHINGTON D C
REPORT.
Rept. for Jul 57-Jun 65,
by Herbert D. Curchack. 4 Oct 65, 60p. Rept. no. TR-1306
Proj. DA-1P014501A31D ,HDL-30300

Unclassified report

Descriptors: (*Transducers, Scientific research), Instrumentation, Measurement, Hypervelocity guns, Electrets, Dielectrics, Physical properties, Chemical properties, Shock waves, Theory, Tunnel diodes, Photochromism, Chemical compounds, Accelerometers, Thermal conductivity, Gas chromatography, Gyroscopes, Infrared radiation

Transducer research has been conducted at HDL, based on a Department of Army program initiated in July 1957. Most of the information attained when this program was terminated in June 1964 has been disseminated; however, certain phases of research have been completed since that time. This report therefore summarizes the documented material, as well as the subsequent efforts. Following a background description of this research program are report abstractions (Part I), taken from the documents considered most essential to the program. Also included are four reports (Part II), summarizing the undocumented results of subsequent work. (Author)

AD-625 950 Fld. 14/2, 8/10, 13/8
CFSTI Prices: HC $3.00 MF $0.75
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
THE CONVERSION OF 16-INCH PROJECTILES TO PRESSURE VESSELS.
Technical note,
by K. O. Gray, and J. D. Stachiw. Jun 65, 67p.
Rept. no. TN-N-755
Proj. Y-F-015-01-07-001

Unclassified report

Descriptors: (*Projectiles, Pressure vessels), (*Pressure vessels, Underwater equipment), Design, Manufacturing methods, Processing, Testing, Oceanographic equipment, Seals (Stoppers), Mechanical drawing, Deep submergence

Pressure vessels for use with fresh water and sea water at pressures up to 20,000 psi have been fabricated from modified 16-inch High Capacity Naval Projectiles. Details for modification of projectiles and the fabrication of supporting equipment are presented. Proof testing procedure and data are described and discussed. (Author)

AD-625 993 Fld. 14/2
THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y
PREPARATION OF ATOMICALLY CLEAN SURFACES OF SI AND GE BY HEATING IN VACUUM,
by F. Jona. 1 Mar 65, 3p. Contract AF49 (638)-1201 Proj. AF-9761 Task 976102
AFOSR 65-2029

Unclassified report

Availability: Published in Applied Physics Letters v6 n10 p205-6 May 15 1965. Copies to DDC users only.

Descriptors: (*Surfaces, Cleaning), (*Silicon, Cleaning), (*Germanium, Cleaning), (*Cleaning, Surfaces), Solids, Heating, Vacuum, Controlled atmospheres, Heat treatment, Electron diffraction analysis

Low-energy electron diffraction patterns indicate that atomically clean surfaces of silicon and germanium can be obtained with heat treatments in vacuo. For silicon, the temperature is lower and the duration shorter than heretofore reported. For germanium, it is demonstrated that ion bombardments are not necessary. In both cases, the surfaces obtained are not planar but often pitted, sometimes heavily (U).

AD-625 998 Fld. 14/2, 7/4
BIOPHYSICS LAB STANFORD UNIV CALIF
AN INSTRUMENT FOR SOFT X-RAY SELECTED ARE MICRODIFFRACTION
by H. H. Pattee. 1964, 9p. Contract Nonr-225 (51) Proj. NR-304-471

Unclassified report

Availability: Published in Advances in X-Ray Analysis v8 p215-22 (Plenum Press, 1965). Copies to DDC users only.

Descriptors: (*X-Ray diffraction analysis, Instrumentation), X-Ray diffraction cameras, Microanalysis

An instrument for soft X-ray selected-area microdiffraction has been constructed fulfilling the principles of optimum intensity for given specimen size and resolution, and permitting direct visual beam focusing and alignment for specimen sizes in the 1-10 micron region. The X-ray source is a modified, two-lens, microfocus tube manufactured by Canal Industrial Corporation supplemented by a camera, specimen stage, and incidentlight microscope. Target-to-film distance may be adjusted from 50 micron to several millimeters which allows the use of wavelengths as long as Al K radiation in air. The use of soft radiation for microsamples simplifies the collimation requirements and permits shorter specimen-to-film distance for a given resolution. Collimating apertures are punched in foil with etched tungsten points or with the microfocus electron beam. Results confirm the prediction that microsamples do not require excessive exposure times using optimum geometry for source size and camera dimensions. (Author)

AD-626 062 Fld. 14/2, 4/2
CFSTI Prices: HC $5.00 MF $1.00
VICTORY ENGINEERING CORP SPRINGFIELD N J
DEVELOPMENT OF FULL RANGE RADIOSONDE HYPSOMETER.
Engineering rept. 1 Jun 53-31 Mar 54.
12 Apr 54, 193p. Contract DA-36-039-SC-52632

Unclassified report

Descriptors: (*Radiosondes, Hypsometers), (*Hypsometers, Radiosondes), Thermistors, Liquids, Selection, Heating elements, Containers, Mathematical analysis, Boiling, Design, Organic materials

AD-626 084 Fld. 14/2
NATIONAL RESEARCH COUNCIL OF CANADE OTTAWA (ONTARIO) DIV OF PURE PHYSICS
A LAPPING DEVICE FOR THE PREPARATION OF THIN SAMPLES OF HIGHLY BRITTLE MATERIALS,
by A. Beck. 26 Apr 65, 1p.

Unclassified report

Availability: Published in Journal of Scientific Instruments v42 p713 Sep 1965. Copies to DDC users only.

Descriptors: (*Brittle materials, Mechanical working), (*Mechanical working, Brittle materials), (*Grinding, Laboratory equipment), Canada

A simple lapping device is described with which long thin rods of rectangular cross section or flat plates (>or = 0.05 mm thick) of very brittle materials can successfully be prepared. (Author)

AD-626 085 Fld. 14/2, 6/13
CFSTI Prices: HC $2.00 MF $0.50
ARMY BIOLOGICAL LABS FREDERICK MD
MICROBIOLOGICAL BARRIER TECHNIQUES.
Technical manuscript.,
by G. Briggs Phillips. Dec 65, 38p. Rept. no. TM-260
Proj. 1C622401A072

Unclassified report

Descriptors: (*Biological laboratories, Laboratory equipment), (*Biological contamination, Control), Safety devices, Decontamination, Sampling, Heat, APORS, Gases, Liquids, Gas filters, Radiation effects, Microorganisms, Germ-free animals

Microbiological barriers prevent the migration of microbial contaminants. Historically, the use of barriers in laboratory operations was documented as early as in the 19th century. In relation to the steps normally taken to detect and control microbiological contamination, the tests used with microbiological barrier systems include air sampling, surface sampling, filter and air incinerator testing, and gas-tightness testing. Microbiological barrier systems can be classified according to purpose, size, and degree of containment. Sterilization and

decontamination agents are used with barrier systems for initial or terminal treatment, for the treatment of supplies and equipment moved in or out of the system, and for the maintenance of its microbiological state during use. Irrespective of the shape and material used for microbiological cabinet barriers, there are certain desirable minimum features. Photographs of a number of present day microbiological barriers and barrier systems are presented. (Author)

AD-626 168 Fld. 14/2, 20/12
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SOLID STATE SCIENCES LAB
DIGH TEMPERATURE FURNACE SYSTEM B-208-R,
by Robert C. Marshall, Charles E. Ryan, Dennis P.Considine, and John J. Hawley. Oct 65, 35p. Rept. no. Instrumentation Papers-85
Proj. AF-5621 Task 562101
AFCRL 65-748
Unclassified report

Descriptors: (*Laboratory furnaces, Crystal growth), High temperature research, Design, Installation, Calibration, Furnaces, Single crystals

The report describes the design, installation, calibration and test of one of the high temperature crystal growing furnace systems of the Solid State Sciences Laboratory of the Air Force Cambridge Research Laboratories. A number of the modifications and innovations that make this system unique are described. Pictures and diagrams of the furnace and associated apparatus and component specifications are sufficiently complete to provide substantial aid in the operation or duplication of this facility. The furnace has been operated above 2800C for short periods of time (hours) and above 2000C for extended periods (days). It has been in operation for over a year and more than 50 separate experiments have been conducted. (Author)

AD-626 230 Fld. 14/2
AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO
AUTOMATIC PLOTTING DEVICE FOR THE SECOND DERIVATIVE OF LANGMUIR PROBE CURVES,
by G. R. Branner, E. M. Friar, and G. Medicus. 2 Aug 62, 9p. Rept. no. AFAL-TR-64-299
Unclassified report

Availability: The Review of Scientific Instruments v34 n3 p231-7 Mar 1963. Copies to DDC users only.

Descriptors: (*Langmuir probes, Oscillographs), Automatic, Harmonic analysis

An electronic device for automatically plotting the second derivative of probe curves is described in detail. A small sinusoidal signal is superimposed on the de probe voltage which is swept manually. The second harmonic in the probe current is filtered, amplified by a low noise cascode amplifier, rectified by a phase-true rectifier, and plotted by an X-Y recorder. The components, the critical points in their wiring, and the performance of the system are described. A quantitative comparison is made with related devices. The system is somewhat simpler than the competing ones and has the advantage of being applicable to the first and the third derivatives as well. (Author)

AD-626 258 Fld. 14/2
CFSTI Prices: HC $2.00 MF $0.50
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
DETERMINATION OF DIAPHRAGM OPENING-TIMES AND USE OF DIAPHRAGM PARTICLE TRAPS IN A HYPERSONIC SHOCK TUBE,
by J. E. Drewry, and AZ. A. Walenta. Jun 65, 47p. Rept. no. UTIAS-TN-90
Unclassified report

Descriptors: (*Shock tubes, Performance (Engineering)), (*Diaphragms (Mechanics), Operation), Particles, Hypersonic flow, Determination, Canada

Experimental investigations were carried out in the UTIAS 4 in. x 7 in. hypersonic shock tube to measure diaphragm opening-times and to evaluate shock tube performance with particle traps located near the diaphragm station. Calculations, based on simple theoretical models, were made in order to obtain approximate comparisons with the experimental results. (Author)

AD-626 261 Fld. 14/2, 9/1, 10/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
PRINCIPLES AND INSTRUMENTATION FOR THE MEASUREMENT OF WORK-FUNCTION VARIATIONS BY ELECTRON-BEAM SCANNING.
Interim rept.,
by Richard E. Thomas, George A. Haas, and Franklin H. Harris. 16 Dec 65, 19p. Rept. no. NRL-6336
Proj. RR-008-03-46-5652
Unclassified report

Descriptors: (*Thermionic converters, Work functions), (*Electron tube parts, Work functions), (*Work functions, Measurement), (*Electron beams, Instrumentation), Measuring devices (Electrical + electronic), Cathode ray tubes, Circuits, Single crystals, Surface properties, Distribution

An experimental tube and associated circuitry were developed to measure the point-by-point variation (or 'patchiness') in the work function of conductive surfaces. The technique involves scanning the surface with a smalldiameter, low-energy electron beam in a television-like fashion. An enlarged image showing the pattern of the work-function variation on the surface is obtained on a kinescope tube. The associated circuitry also provides a method of obtaining, during one scan, the values of the work functions of many small regions of the scanned surface. These individual values are automatically catalogued and stored by means of a 400-channel analyzer which gives a plot of the area distribution in work function in about three seconds. This instrumentation was primarily designed for the purpose of measuring patch distributions on surfaces that might be used as thermionic sources of electrons in vacuum tubes and energy converters. (Author)

AD-626 358 Fld. 14/2
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
NONLINEAR NETWORK FOR THE MEASUREMENT OF THE RELATIVE ELECTRICAL CONDUCTIVITY BETWEEN HIGHLY CONDUCTING MATERIALS,
by Barry T. Lubin, Tibor L. Foldvari, and William D. Jackson. 5 May 65, 2p. Contract DA-36-039-AMC-03200 (E) ,AF33 (615)-1083
Unclassified report

Availability: Published in The Review of Scientific Instruments v36 n11 p1163-4 Nov 1965. Copies to DDC users only.

Descriptors: (*Measuring devices (Electrical + electronic), Electrical conductance), (*Electrical conductance, Measuring devices (Electrical + electronic), Nonlinear systems, Electrical networks, Coils, Measurement

The note describes a technique for determining the relative electrical conductivity between by using an inductive coil method in conjunction with a nonlinear network that has been previously used for inductive transducers. The method indicates a possibility to measure the electrical conductivity in situations where direct contact measurements are difficult or impossible to make, such as in the case of a two-phase liquid metal flow. The basic circuit has an ac generator, with two diodes connected in series with the measuring coils. The sensitivity of the circuit increases both with increasing operating frequency and linearly with increasing Q of the coils. Skin effect provides a practical upper limit on the operating frequency; for skin depths other than zero not only the coil resistance, but also its inductance will change.

AD-626 403 Fld. 14/2, 8/11
CFSTI Prices: HC $3.00 MF $0.75
GEOTECHNICAL CORP GARLAND TEX
GEOTECH ANALOG SPECTRUM ANALYZER.
Technical rept.,
by W. W. Whyte,III, and R. S. Simons. 16 Jul 65, 94p. Rept. no. TR-65-67
Contract AF33 (657)-12145 Proj. AFTAC-VT/4051
Unclassified report

Supported in part by ARPA.

Descriptors: (*Spectrum analyzers, Analog systems), Fourier analysis, Wave analyzers, Wave functions, Signal-to-noise ratio, Seismology

The Goetech analog spectrum analyzer and the manner in which it operates are discussed in general terms. The fundamentals of Fourier analysis, as they relate to the operation of the system, are outlined. Sufficient detail is provided to give a working comprehension of the analyzer and the spectrograms it produces. The results of various tests on the electronic characteristics of the system are presented. These include frequency and phase response, noise level, and linearity. An assessment is made of the overall accuracy of the spectrograms. The spectra of simple repetitive waveshapes and transients are discussed and examples given. (Author)

AD-626 521 Fld. 14/2
CHARGED PARTICLE RESEARCH LAB UNIV OF ILLINOIS URBANA
PRODUCTION OF UNIFORM-SIZED LIQUID DROPLETS.
Revised ed.,
by N. R. Lindblad, and J. M. Schneider. 17 May 65, 6p. Contract AF-AFOSR-107-64 ,NSF-GP-2528
AFOSR 65-2496
Unclassified report

Revision of manuscript submitted 1 Apr 65.

Availability: Published in Journal of Scientific Instruments v42 p635-8 Aug 1965. Copies to DDC users only.

Descriptors: (*Drops, Test methods), Laboratory equipment, Production, Capillary tubes, Piezoelectric transducers, Surface tension, Theory

A method for producing a stream of uniform-sized liquid droplets and individual droplets is discussed in detail. The method is based on the principle that a cylinder of liquid (jet) is dynamically unstable under the action of surface tension. When a capillary wave of a prescribed wavelength is applied to the jet, the jet will disintegrate into a stream of uniform-sized droplets. Since the droplet size depends on the capillary tube through which the liquid flows, the size can be easily varied. A piezoelectric transducer is used to produce the capillary wave on the jet. The apparatus discussed will produce droplets in a range between 25 and 350 micrometers in radius. The method is unique in that the droplet size can be precisely controlled and individual droplets can be produced at will. (Author)

AD-626 571 Fld. 14/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C

LIMITATIONS OF INSTRUMENTATION FOR MECHANICAL SHOCK MEASUREMENT.
Interim rept.,
by M. W. Oleson. 1 Dec 65, 29p. Rept. no. NRL-6342
Proj. SF-013-10-02-1803 ,RR-009-03-45-5750

Unclassified report

Revision of manuscript submitted 11 Aug 1965.

Descriptors: (*Shock (Mechanics), Measurement), (*Instrumentation, Shock (Mechanics)), State-of-the-art reviews, Test equipment, Selection, Accelerometers, Piezoelectric gages, Piezoelectric transducers, Strain gages, Transducers, Test methods, Experimental data, Errors

The report is basically a review of contemporary mechanical shock measurement practice, the applicable instruments, and their range of use. It includes discussion of the problem factors which condition selection of a measurement system, most of the commonly employed transducers, a representative shock measurement application, and elementary accuracy considerations. A recent program carried out involving 1500 shock records provides useful examples of shock measurement applications of a variety of transducers. No specific conclusions or recommendations are presented in the report, since the purpose is to outline the capabilities and limitations of instrumentation suited for use in a variety of measurement problems.

AD-626 587 Fld. 14/2
CFSTI Prices: HC $1.00 MF $0.50
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD
DESIGN OF A COMPENSATED ELECTROMAGNETIC VELOCITY TRANSDUCER.
Research and development rept.,
by Joseph I. Schwartz, and R. B. Tupper. Jan 66, 21p. Rept. no. MEL-12/66

Unclassified report

Descriptors: (*Vibration, Measurement), (*Transducers, Vibration), Bearings, Probes, Instrumentation, Design, Programming (Computers), Analysis, Velocity

An analog computer study was made of a new concept of probe-type velocity transducer which is intended to eliminate the errors presently introduced by relative motions between the probe and the magnetic housing. The study indicates a high probability of success, and the controlling physical parameters were identified. (Author)

AD-626 645 Fld. 14/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED PHYSICS
DOES THE METRIC SYSTEM THREATEN CANADIAN TRADE,
by L. E. Howlett. 1965, 3p.
NRC 8693

Unclassified report

Availability: Published in Engineering Journal p1-3 Nov 1965. Copies to DDC users only.

Descriptors: (*Measurement, Canada), (*Canada, Measurement), (*Commerce, Canada), Weight, History

An economic survey is proposed of Canada's present and potential forign markets to determine the reaction of customers to buying articles, manufactured and packaged, in accordance with Canada's system of units and to estimate the probable trend of market reaction in this respect for the foreseeable future. Those who make the survey must have commercial experience and they must be properly briefed in general terms on the important undelying question. With collection of this information, Canada should be able to decide whether economic considerations can be expected to force Canada ultimately to adopt the International System of Units to protect its foreign trade.

AD-625 873 **See Fld. 4/2**

AD-625 945 **See Fld. 20/9**

AD-626 029 **See Fld. 6/5**

AD-626 161 **See Fld. 14/4**

AD-626 179 **See Fld. 11/9**

AD-626 344 **See Fld. 20/9**

AD-626 404 **See Fld. 8/11**

AD-626 481 **See Fld. 15/3**

AD-626 500 **See Fld. 8/6**

AD-626 528 **See Fld. 8/11**

AD-626 600 **See Fld. 18/3**

AD-626 602 **See Fld. 13/8**

AD-626 643 **See Fld. 17/3**

14/4. RELIABILITY

AD-625 724 Fld. 14/4, 9/2, 5/2
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE CORP SAN BERNARDINO CALIF TECHNOLOGY DIV
RELIABILITY INFORMATION/MONITORING SYSTEM (RIMS): CAPABILITY DEMONSTRATION.
Sep 65, 132p. Rept. no. TOR-669 (S6855-12)-1
Contract AF04 (695)-669

Unclassified report

Descriptors: (*Reliability, Information retrieval), (*Information retrieval, Reliability), Monitors, Programming languages, Programming (Computers), Computers, Data processing systems, Dictionaries

The recognized need for reliability experience retention, correlation, and analysis, and the proliferation of data collection systems without provision for usage have led to the concept of a comprehensive reliability information and monitoring system, designated as RIMS. It has been found that such a system is obtainable with a comparatively small effort, since many of its constituent elements can be built up from existing information processing hardware and software. This report documents the efforts to demonstrate the capability of such a system, and provides a baseline for further improvement and application of the system concept. (Author)

AD-626 161 Fld. 14/4, 9/1, 14/2
CFSTI Prices: HC $4.00 MF $1.00
PRINCETON UNIV N J
AN INVESTIGATION OF THE APPLICATION OF FEEDBACK AND COMPARATOR CONCEPTS TO SENSITIVE SEMICONDUCTOR INSTRUMENTS.
Final technical rept.,
by Enoch J. Durbin, Gerard J. Born, and Kazuaki Takashima. Oct 65, 135p. Rept. no. 741
Contract AF33 (657)-10069 Proj. AF-8222
Task 822203
FDL TR-65-76

Unclassified report

Descriptors: (*Semiconductor devices, Temperature sensitive elements), (*Temperature sensitive elements, Reliability), Feedback, Comparators, Errors, Energy, Measurement, Mathematical analysis

A theoretical and experimental investigation was made of the application of feedback to semiconductor energy sensors. By the application of feedback the sensor becomes an energy comparator with improved dynamic response. The comparator characteristics are determined by their physical (mechanical) characteristics towards their environment and are practically independent of the electrical sensor characteristics. Simple compensation over a wide temperature is then often possible. Practical applications are discussed and evaluated such as, temperature measurement, RMS measurement, pressure measurement and radiation measurement. (Author)

AD-626 416 **See Fld. 16/4**

14/5. REPROGRAPHY

AD-626 192 Fld. 14/5
CFSTI Prices: HC $2.00 MF $0.50
BOEING CO SEATTLE WASH AEROSPACE GROUP
DISPLAY DEVICE, DRY FILM PROCESSING OF OVERLAYS FOR DATA DISPLAY.
Quarterly progress rept. no. 1, 1 Jun-31 Aug 65,
by Roy C. Wilcox. 31 Aug 65, 39p. Contract DA-28-043-AMC-00452 (E) Proj. 1X6-40603-D494-03-16

Unclassified report

Descriptors: (*Photographic equipment, Display systems), Cathode ray tube screens, Photographic film, Ultraviolet radiation, Phosphorescent materials, Fiber optics, Photographic processing equipment, Cathode ray tubes

The report reviews the general approaches to the problem of creating a display device which accepts an electrical signal input and records the information on a dry processed film suitable for multiple gate projection. Preliminary specifications for frame sizes and fixing the approach to the copy technique facilitated ordering the transfer lens. Four CRT phosphers were tested with reference to supplying the energy to expose Kalvar film. Resolution requirements for the various copy stages were assigned, and three fibre optic face plates were ordered. Measurements on Radio Frequency Interference from arc lights used in the film copy process were made and a shielded lamp house was designed. Kalvar chips furnished by USAECOM were checked for performance characteristics. (Author)

15/3. DEFENSE

AD-625 692 Fld. 15/3, 16/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ACTIVE AND PASSIVE DEFENSE,
by A. L. Later, and E. A. Martinelli. Aug 65, 14p. Rept. no. P-3165

Unclassified report

Descriptors: (*Defense systems, Shelters), (*Antimissile defense systems, Effectiveness), Blast, Bombers, Nuclear weapons, Guided missiles (Surface-to-air), Launching, Costs, Federal budgets, Urban areas, Rural areas

The report is primarily concerned with blast shelters, which are a passive form of defense. The technical aspects of active defense, i.e., intercepting and destroying the attacking bombers and ballistic missiles, are also examined, and the effectiveness of the active and passive defense systems are compared.

AD-625 802 Fld. 15/3
CFSTI Prices: HC $3.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
SUPPLEMENTAL ANALYSIS. CIVIL DEFENSE RESCUE.
Final rept.,
by John L. Crain, Robert K. Meister, Lacy G. Thomas, and Eugene M. Spurlock. Aug 65, 74p. Contract OCD-PS-64-55 Proj. SRI-4727 Task 2511b

Unclassified report

Descriptors: (*Civil defense systems, Rescues), (*Rescues, Civil defense systems), (*Nuclear warfare, Civil defense systems), Debris, Casualties, Fires, Damage assessment, Vulnerability, Civil defense personnel, Monitors, Acoustics, Acoustic detectors

Personnel casualty and trapping functions: Six personnel casualty functions are enumerated to describe the percentage breakdown of the population following a nuclear attack. These functions specify, by distance from ground zero, the percentage of those (1) killed immediately, (2) trapped, (3) nonambulatory seriously injured, (4) ambulatory seriously injured, (5) lightly injured, and (6) uninjured. Relationship between fire and rescue: The outer radius of initial ignitions from thermal energy is highly sensitive to visibility. Outer ignition radii also vary greatly between surface and air bursts. In the former case, the angle from the fireball to the outside radius of ignitions is 2 to 3 degrees. Tops of houses are the only residential material assumed visible and subject to ignition by thermal energy. With air bursts, interior kindling fuels are assumed to be exposed to direct thermal energy through windows, and thus to be the principal causes of structural ignition. Postattack rescue system criteria: For preliminary planning purposes, a national rescue force of approximately one million men is suggested. If this force were to be responsible for initial medical treatment, mass-casualty sorting, and removal of nonambulatory injured, it would have to be several times larger. Location of trapped survivors by acoustical methods: Little research has been performed in applying sensors that will detect faint vibrations transmitted by solid materials in contact with buried survivors.

AD-625 867 Fld. 15/3, 13/12, 18/3
CFSTI Prices: HC $3.00 MF $0.75
LIN (T Y) AND ASSOCIATES VAN NUYS CALIF
REUSABILITY OF BUILDINGS AFTER A WARFIRE.
Final rept.,
by G. E. Troxell, J. K. Degenkolb, K. L. Benuska, and B. R. Loya. Jan 64, 70p. Contract OCD-OS-63-172 Proj. OCD-1100 Task 1150
Unclassified report

Descriptors: (*Buildings, Nuclear explosions), (*Nuclear explosions, Fires), (*Fires, Damage assessment), Fire safety, Civil defense systems, Debris, Blast, Programming (Computers), Ignitioon

The report provides a method for the calculation of a fire resistance rating by utilizing an electronic computer program. The evaluation is divided into two parts; the resistance to interior exposure and the susceptibility to exterior exposure. Resistance to interior exposure is rated by estimating the probable severity of interior fire, assuming ignition of combustible contents, then combining this estimate with the fire resistance and economic value of the building. The reduced economic value which is calculated as a percentile is referred to as the 'Building Reusability Index' (BRI). Susceptibility to exterior exposure is evaluated in terms of an 'Exposure Protection Index' (EPI). The rating system was prepared assuming no fire fighting or public utilities available. (Author)

AD-626 074 Fld. 15/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
UNITED STATE CIVIL DEFENSE,
by O. Tolstikov. Dec 65, 13p. Rept. no. LT-65-106
TT 66-60193
Unclassified report

Trans. of mono. Yadernye Vek i Voina (The Nuclear Age and War), Moscow, 1964 p123-32.

Descriptors: (*Civil defense systems, United States), Nuclear warfare, Nuclear warfare casualties, Radiological contamination, Fallout shelters, Civil defense personnel, Attitudes, Public opinion, USSR

AD-626 481 Fld. 15/3, 22/2, 1/3, 14/2
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH AND TECHNOLOGY DIV AIR FORCE SYSTEMS COMMAND WASHINGTON D C
BIBLIOGRAPHY OF TECHNICAL PRESENTATIONS AND PUBLICATIONS, JULY 1964-JULY 1965.
Jul 65, 26p.
Unclassified report

Descriptors: (*Air Force Systems Command, Air force research), (*Air force research, Bibliographies), Systems engineering, Military publications, Aerospace craft, Materials, Electronics, Fuels, Lubricants, Coatings, Propellants, Flight control systems, Propulsion, Weapon systems, Aeronautics, Documentation

A selected bibliography is given of the publications of the Air Force Laboratories and the Systems Engineering Group of the Research and Technology Division. They are presented alphabetically by technical domain, beginning with advanced vehicle concept and ending with weapons and munitions.

AD-626 605 Fld. 15/3, 5/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ECONOMIC RECOVERY,
by Jack Hirshleifer. Aug 65, 22p. Rept. no. P-3160
Unclassified report

Descriptors: (*Nuclear warfare, Recovery), (*Economics, Nuclear warfare), Survival, Disasters, Civil defense systems

Contents: Possibility of economic survival and recovery; resource availability versus needs; policy, controls, and incentives; implication for pre-attack preparation. (To constitute a chapter of a book on civil defense being edited by Prof. Eugene Wigner.)

AD-625 727 **See Fld. 9/2**

AD-625 866 **See Fld. 13/12**

AD-626 072 **See Fld. 5/1**

AD-626 106 **See Fld. 5/4**

AD-626 526 **See Fld. 5/9**

15/4. INTELLIGENCE

AD-626 076 Fld. 15/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
PENTAGON'S FAR-REACHING RADIO EARS,
by N. Illin. 21 Dec 65, 9p. Rept. no. LT-65-109
TT 66-60195
Unclassified report

Trans. from Krasnaya Zvezda (USSR) 9 Jun 1964.

Descriptors: (*Electronic intelligence, Department of Defense), Military intelligence, Satellites (Spacecraft), Spacecraft, USSR

The USA through its Central Intelligence Agency and National Security Agency is said to be conducting electronic espionage, especially at the reconnaissance posts placed on U. S. military bases located abroad. The U-2 spy incident of May 1960 is recalled, the plane reportedly being capable of collecting radio intelligence. Furthermore, development and application of artificial earth satellites and manned orbital spacecraft for reconnaissence is supposedly under way in the USA. The Soviet armed forces are said to possess a 'guarantee that the far-reaching Pentagon 'ears' for electronic espionage will fail to justify the hope placed in them by the international imperialists circles.'

15/5. LOGISTICS

AD-626 087 Fld. 15/5, 14/1, 5/9
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
ESTIMATING AIRCRAFT BAS MAINTENANCE PERSONNEL,
by P. F. Dienemann, and G. C. Sumner. Oct 65, 91p. Rept. no. RM-4748-PR
Contract AF49 (638)-700
Unclassified report

Descriptors: (*Maintenance personnel, Cost effectiveness), (*Air force personnel, Military facilities), Manpower studies, Costs

The maintenance personnel were divided into three functional categories: direct maintenance, maintenance overhead, and other maintenance. For the first category, a series of relationships was developed to estimate personnel requirements (man-hours per flying hour) for advanced aircraft based on the design and performance characteristics. From these estimates is derived the requirement for maintenance overhead. With minor exceptions, all other maintenance personnel can be estimated using current USAF manning procedures, the techniques of which are summarized. (Author)

AD-626 422 Fld. 15/5, 9/2
CFSTI Prices: HC $5.00 MF $1.00
AMERICAN POWER JET CO RIDGEFIELD NJ
PREDICTION OF THE EFFECTS OF COMBINED AND SEQUENTIAL ENVIRONMENTS.
Final rept.,
by George Chernowitz, S. J. Bailey, S. Gurman, and S. M. Levin. Jul 65, 165p. Rept. no. APJ-415-1
Contract DA-36-038-AMC-1784 (A) Proj. DA-1V025001A622 Task 1V025001A62208
FA R-1793
Unclassified report

Descriptors: (*Environment, Army equipment), (*Logistics, Environmental tests), (*Environmental tests, Logistics), Materials, Armed forces supplies, Electrical networks, Linear systems, Nonlinear systems, Climatology, Electrical equipment, Computers, Computer storage devices, Computer logic, Mathematical prediction, Man-machine systems

The project applies advanced techniques to determine the environmental competence of materials and equipments under combined and sequential environments experienced by Army systems and components in field operation. The critical aspect of environmental interaction is thoroughly treated and integrated into the overall approach. A plan is presented for receiving, organizing, and operating on the problem elements to yield the desired output of environmental effects prediction. The plan is specifically designed for computerization. The rationale is set forth in a logical and comprehensive framework that may be readily understood and implemented by the potential user. A pilot exercise of the computerized prediction system gives specific examples of the system operation in specific instances. Conclusions and recommendations are offered regarding system practicality, usefulness, potentialities and limitations, and the guideposts presented for future action in the field of environmental effects prediction. (Author)

AD-626 153 **See Fld. 14/1**

AD-626 604 **See Fld. 12/2**

15/6. NUCLEAR WARFARE

AD-626 073 See Fld. 5/4

15/7. OPERATIONS, STRATEGY, AND TACTICS

AD-626 075 Fld. 15/7, 5/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
AN AMERICAN HISTORIAN'S DISTORTIONS OF THE LENINGRAD EPIC,
by G. Bukin. Dec 65, 13p. Rept. no. LT-65-108
TT 66-60194

Unclassified report

Trans. of Voenno-Istoricheskii Zhurnal (USSR) n1 p85-8 1964.

Descriptors: (*Military operations, USSR), (*History, USSR), Reviews, Warfare

The review of the book by Leon Goure, 'The siege of Leningrad,' charges that Goure believes it would have been more sensible to give up the city to the mercy of the victor, that he does not condem the fascists for the human losses in Leningrad caused by bombing and hunger, and that he believes that the Leningraders under siege thought only about themselves, their own local interests, belongings, and meager well-being.

AD-626 077 Fld. 15/7, 5/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
MILITARY DOCTRINE AND MILITARY SCIENCE,
by S. Kozlov. 29 Dec 65, 19p. Rept. no. LT-65-111
TT 66-60196

Unclassified report

Voennaya Doktrina i Voennaya Nauka. Trans. of Kommunist Voorzhennykh Sil (USSR) n5 p9-16 1964.

Descriptors: (*Military strategy, Theory), Nuclear weapons, Warfare, History, Political science, USSR

AD-626 287 Fld. 15/7
CFSTI Prices: HC $1.00 MF $0.50
ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE (ARMY) WASHINGTON D C
HOW THE LAST CAMPAIGN TO DEFEAT HITLER'S GERMANY WAS PLANNED. (KAK PLANIROVALAS' POSLEDNYAYA KAMPANIYA PO RAZGROMU GITLEROVSKOY GERMANII),
by S. Shtemenko. 1965, 15p. Rept. no. ACSI-I-7982
TT 66-60235

Unclassified report

Trans. of Voenno-Istoricheskii Zhurnal (USSR) n5 p56-72 1965.

Descriptors: (*Armed forces (Foreign), USSR), (*Warfare, East Germany), West Germany, History

Account of the planning by the General Staff of the Soviet Armed Forces for the last campaigns against Hitlers' Germans during World War II.

16/2. MISSILE TRAJECTORIES

AD-626 152 Fld. 16/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY ROCKET AND GUIDED MISSILE AGENCY REDSTONE ARSENAL ALA
ELLIPTICAL EQUATIONS FOR FREE FLIGHT: A TREATMENT SHOWING EQUALITY BETWEEN THREE SYSTEMS OF ELLIPTICAL EQUATIONS,
by Richard A. Dillard. 1 Dec 60, 17p. Rept. no. ARGMA-TM-2E8M
Proj. TUI-9007

Unclassified report

Descriptors: (*Free flight trajectories, Guided missiles), Equations of motion, Ranges (Distance), Time, Velocity, Momentum, Guided missile trajectories

At the present time, there exists within Systems Analysis Laboratory three sets of elliptical equations for free flight range and time of flight. The equality that exists between the three sets is shown. The three sets in question are those by Johnston (OML Rpt. 6R7F), Powell (SAL Internal Note) and Wheelon (ARS Journal, Vol. 29, December 1959). The free flight range, , as given by each set, is sshown to be equal for all sets by first equating Johnston and Powell, then Powell and Wheelon. The time of free flight is shown to be equal between Johnston and Powell. Wheelon's equations for time are written for the time from launch to impact, and therefore are not shown here. (Author)

AD-626 574 Fld. 16/2, 9/2
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
OPERATION AND MAINTENANCE OF PHASE ERROR PROGRAMMER. MODEL 9600.
May 59, 38p. Rept. no. TG-347
Contract NOrd-7386

Unclassified report

Descriptors: (*Phase (Electronics), Guidance), (*Radar tracking, Guided missile trajectories), Errors, Correction, Programming (Computers), Guided missile computers, Cams, Instruction manuals

The model 9600 Phase Error Programmer is a cam driven programmer capable of varying the angle by which the FM leads the AM in the guidance beam. This equipment is to be used with the SPQ-5 radar and the Mark 23 computer for correcting phasing error during missile tests which employ crossing targets. The unit is permanently connected to the ship's system and is automatically started by the first motion switch. Phasing error introduced to the ship's system is zero whenever the unit is not in use. Individual cams are required for each target trajectory. The programmer is limited to a maximum phasing error correction of plus or minus 50 deg and in flight time to 75 seconds.

16/4. MISSILES

AD-625 891 Fld. 16/4, 20/13
CFSTI Prices: HC $1.00 MF $0.50
ARMY BALLISTIC MISSILE AGENCY REDSTONE ARSENAL ALA
PROCEDURE FOR CALCULATING AMOUNT OF TOTAL HEAT, RECEIVED BY SURFACE EXPOSED TO TIME DEPENDENT HEATING RATES.
Technical memo.,
by Max E. Nein. 3 Feb 58, 14p. Rept. no. TM-G-099 ,DS-M-197

Unclassified report

Descriptors: (*Heat transfer, Guided missiles), (*Guided missiles, Heat transfer), Digital computers, Mathematical analysis, Surfaces, Geometric forms, Surface area, Heat

Missile heat transfer problems often require that the amount of total heat received by the various surfaces of the missile be determined for certain periods of flight. For this purpose a method is given which can be applied in connection with the use of a high speed digital computer.

AD-625 692 See Fld. 15/3

AD-626 301 See Fld. 20/4

AD-626 417 See Fld. 9/1

16/4.1 AIR- AND SPACE-LAUNCHED MISSILES

AD-626 218 Fld. 16/4.1
CFSTI Prices: HC $6.00 MF $1.25
DAVID TAYLOR MODEL BASIN WASHINGTON D C AERODYNAMICS LAB
TRANSONIC WIND-TUNNEL TEST OF A 24-PERCENT SCALE MODEL OF THE BULLPUP 'B' MISSILE,
by Garland G. Bryant, and Walter S. Thomas.
Jul 60, 204p. Rept. no. Aero-986

Unclassified report

Descriptors: (*Guided missiles (Air-to-surface), Model tests), Transonic wind tunnels, Aerodynamic configurations, Canard configuration, Control surfaces, Roll, Angle of attack, Deflection

An investigation was performed on a model of the Bullpup 'B' missile in order to determine the aerodynamic effects of various body shapes, various canard sizes and hinge locations, and a number of wing roll-tab deflections. The tests were performed over a Mach number range from 0.8 to 1.17 and an angle-of-attack range from -4 deg. to 10 deg. at roll angles of 0, 11 1/4, 22 1/2, and 45 degrees. In addition to conventional six-component force data, canard hinge moments were measured at various canard deflections. The report presents the data without analysis. (Author)

AD-626 416 Fld. 16/4.1, 19/5, 14/4
CFSTI Prices: HC $1.00 MF $0.50
ARINC RESEARCH CORP ANNAPOLIS MD
AN/AWG-10 MISSILE CONTROL SYSTEM RELIABILITY AND MAINTAINABILITY STUDY.
Status letter.
Dec 65, 8p. Rept. no. SL-7
Contract NOw-65-0502-f

Unclassified report

Descriptors: (*Aircraft fire control systems, Guided missiles (Air-to-air)), (*Maintenance, Aircraft fire control systems), (*Reliability (Electronics), Aircraft fire control systems), Statistical data, Control systems

The general purpose of this study is to perform an extensive reliability/maintainability assessment of the AN/AWG-10 Missile Control System (MCS) being fabricated and tested for the improved F-4 series aircraft. Routine data collection continues at the Westinghouse and Naval Missile Center activities. Data is given which shows the number of failure/removal reports received from Westinghouse (to date) on five separate serialized systems since (Design Analysis Test) commenced; pre-DAT reports are not included.

17/1. ACOUSTIC DETECTION

AD-625 670 See Fld. 14/2

17/2. COMMUNICATIONS

AD-625 730 Fld. 17/2, 9/2
CFSTI Prices: HC $2.00 MF $0.50
ELECTRONIC ASSOCIATES INC LONG BRANCH N J
VOICE ACTUATED ADDRESS MECHANISM.
Quarterly progress rept. no. 2, 1 Jun-31 Aug 65, by Donald Fraipont. 15 Nov 65, 36p. Contract DA-28-043-AMC-01223 (E) Proj. DA-1P6-20501-A448-02-20

Unclassified report

See also AD-620 941.

Descriptors: (*Speech recognition, Telephone communication systems), (*Telephone communication systems, Speech recognition), Feasibility, Vocabulary, Input-output devices, Simulation, Voice communication systems, Learning, Filters, Computer storage devices, Digital systems, Programming (Computers)

Most of the work was related to investigations leading to: (1) The improvement of preprocessing techniques; (2) The improvement of the efficiency of 'Learning'. Included is the program extending the learning capability to include mass storage of a large set of training voices. The program is an automated learning program and a minimum of operator intervention is required. Several programs designed to test voiced words for ease of separation were written, debugged, and applied to VAAM"s vocabulary. A filter correlation program was ?hqluqked. Two other programs were used to search for elements of the digital voicings which would yield an indication of the separability of VAAM's vocabulary. (Author)

AD-625 853 Fld. 17/2, 20/14
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
MODEM TESTING WITH A MULTIPATH TRANSMISSION SIMULATOR.
Technical rept.,
by Elis D. Hanson. Sep 65, 21p. Rept. no. ECOM-2633
Proj. DA-5681-12-925-05-10
Unclassified report

See also AD-610 675.

Descriptors: (*Data transmission systems, Model tests), (*Multipath transmission, Simulators), (*Radio transmission, High frequency), Modulation, Demodulation, Transmitter-receivers, Phase shifters, Frequency shift keyers, Performance (Engineering)

This report covers the results of several 'on the bench' tests performed on engineering test models of modulatordemodulator MD-515. The MD-515 is a 12 channel, phase shift keyed (psk) data modem designed to operate at either 2400 or 1200 bps. In the 1200 bps mode, the option of either in-band frequency diversity or double baud length signaling elements is available. The first series of tests involved the use of a multipath transmission simulator to evaluate the performance of the modem under controlled conditions of selective fading and phase perturbations. Other tests were performed by adding noise to the line signal to measure the error rate vs signal-to-noise ratio, the dynamic range of the equipment and the effect of peak limiting the line signal prior to transmission. A brief description of the modem and the simulator are included in the report. (Author)

AD-626 618 Fld. 17/2, 13/6
CFSTI Prices: HC $3.00 MF $0.75
CBS LABS STAMFORD CONN
TRANSDUCER AND INTERPHONE SYSTEM FOR OPERATION IN HIGH-AMBIENT NOISE.
Quarterly progress rept. no. 4, 1 Apr-30 Jun 65,
by Allan J. Rosenheck, Emil L. Torick, and Alfred L. DiMattia. 30 Jul 65, 60p. Contract DA-28-043-AMC-00257 (E) Proj. DA-1G6-41209-D-534-24
Unclassified report

Descriptors: (*Intercommunication systems, Armored vehicles), (*Armored vehicles, Intercommunication systems), Military requirements, Transducers, Noise, Earphones, Acoustic insulation, Performance insulation, Amplifiers, Automatic gain control, Helmets

The report discusses work performed toward development of an improved Transducer and Interphone System for operation in high-ambient noise. Work progressed toward development of a tubular microphone shield. Included was an evaluation of several acoustical materials, and the fabrication of a practical shield. Earphone enclosures with LFC (Low Frequency-Coupled) volumes were constructed and tested, and results are presented herein. Performance of the present communications system was evaluated and compared with expected performance of a CBS Laboratories-designed system. Psychoacoustic tests were performed to relate articulation index with phonetically-balanced word testing. Basic electronic design of the system was completed. Each system comprises three crewmember units and an interphone amplifier. Circuits for achieving automatic gain control and squelch operation are described, including four methods for accomplishing automatic gain control. Detailed circuit descriptions as well as system designs were incorporated into the interphone amplifier, and are also described. (Author)

AD-625 859 **See Fld. 9/2**

AD-625 889 **See Fld. 4/2**

17/2.1 RADIO COMMUNICATIONS

AD-625 868 Fld. 17/2.1
CFSTI Prices: HC $6.00 MF $1.25
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y
USE OF SUNDE TROPO CHANNEL MODEL TO PREDICT ERROR PROBABILITIES OF AMRT TESTS.
Final rept. Aug 64-Sep 65,
Dec 65, 202p. Rept. no. RADC-TR-65-427
Proj. AF-4519 Task 451902
Unclassified report

Descriptors: (*Radio communication systems, Troposphere), (*Probability, Errors), (*Data transmission systems, Digital systems), Pulse code modulation, Multiplex, Frequency modulation, Radio receivers, Radio transmitters, Mathematical models, Models (Simulations), Mathematical prediction, Performance (Engineering)

Details and results of analyses and calculations are provided which were used to compute the error probabilities obtained in transmitting digital data through the Atlantic Missile Range Tropospheric Scatter Communication Channel. This effort provided a communication system model upon which these calculations could be based. The Sunde model of the tropo medeedium was used. Three digital PCM systems were analyzed, and compared to the FDMFM mode of operation. The AN/GSC-4 was used as a data source at 2400 bits/second for one of the 24 voice channels which were being multiplexed. The AN/MRC-98 transmitters and receivers were used on the tests. The results of computation agree with the experimentally measured data. The predictions are compared with the actual results, and the modeling technique is discussed. The satisfactory comparison of theory to experiment leads to the conclusion that the Sunde model of the tropo communication is a good one, and useful for prediction of error probabilities through a particular communication medium. (Author)

AD-626 421 Fld. 17/2.1, 9/3
CFSTI Prices: HC $3.00 MF $0.75
GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION
ELECTRONIC EQUIPMENT INTERFERENCE CHARACTERISTICS-COMMUNICATION TYPE.
Quarterly rept. no. 9, 1 May-31 Sep 65,
by William R. Free. Oct 65, 72p. Rept. no. 30, A-678-9
Contract DA-36-039-AMC-02294 (E) Proj. DA-1E6-20501-D-449
ECOM 02294-9
Unclassified report

Continuation of Contract DA-36-039-sc-87183. See also AD-618 722.

Descriptors: (*Electronic equipment, Radiofrequency interference), (*Communication equipment, Radiofrequency interference), (*Radiofrequency interference, Measurement), (*Antennas, Radiofrequency interference), Electromagnetic shielding, Very high frequency, Ultrahigh frequency, Broadband, Probes (Electromagnetic), Military equipment

During the period covered by this report, investigations to extend the determination of the interference characteristics of U. S. Army communication equipment to include the case emission and susceptibility characteristics have continued. The major emphasis during this period has been on the development and evaluation of broadband, balanced, circularly-polarized antennas for use in measurements of the interference characteristics of communication equipment in shielded enclosures. The design, fabrication, and evaluation of (1) a conical loghelix antenna, (2) a circularly-polarized log-periodic antenna, (3) a crossed bowtie antenna, and (4) a hooded antenna are discussed. These antennas were designed to operate in the 200 Mc to 1000 Mc range. Techniques for extending the use of these antennas to lower frequencies are discussed. (Author)

AD-626 157 **See Fld. 20/14**

AD-626 385 **See Fld. 17/7**

AD-626 620 **See Fld. 8/3**

AD-626 637 **See Fld. 9/1**

17/3. DIRECTION FINDING

AD-626 089 Fld. 17/3, 17/9, 17/8
CFSTI Prices: HC $3.00 MF $0.50
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
AUTOMATIC TRACKING WITH SEQUENTIAL LOBING.
Technical memo.,
by Roy L. Rogers. 16 Aug 65, 51p. Rept. no. edl-M904
Contract DA-28-043-AMC-00379 (E)
Unclassified report

Descriptors: (*Tracking, Antenna lobes), Automatic, Broadband, Direction finding, Scanning, Errors, Demodulation, Automatic gain control, Very high frequency, Ultrahigh frequency, Superhigh frequency, Beams (Electromagnetic), Analysis, Antenna arrays, Horn antennas, Optical tracking, Demodulators, Phase (Electronics)

This report analyzes the problem of automatic tracking with a passive RF system by sequential lobing of antenna beams. The analysis is general enough to be applied to optical, infrared, and sonar passive tracking systems. Among the problems considered are (a) processing of tracking-error waveforms, (b) demodulations techniques, (c) antenna-beam gradient and resolution, (d) pulse detection, (e) the lobing rate, and (f) receiver AGC requirements. The conclusion drawn is that the sequential-lobing system, compared to the conical-scan system, is as accurate, has the advantage of a variable lobing rate, and can change antenna beams electronically, but its signal-processing circuitry is more complex. Results of the analysis were applied to the development of wideband (50 to 500 Mc and 1 to 11 Gc) sequential-lobing tracking systems. (Author)

AD-626 643 Fld. 17/3, 14/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING

PERFORMANCE OF AN INTERFEROMETER DIRECTION FINDER FOR THE H. F. BAND.

Revised ed.,
by N. Burtnyk, C. W. McLesh, and J. Wolfe. 29 Jun 65, 5p.
NRC 8668

Unclassified report

Revision of manuscript received 27 Apr 65.

Availability: Published in Proceedings IEEE v112 n11 p2055-9 Nov 1965. Copies to DDC users only.

Descriptors: (*Interferometers, Direction finding), (*Direction finding, Performance (Engineering)), High frequency, Radio equipment, Ionosphere, Reflection, Radio waves, Test methods

An h.f. direction finder consisting of two orthogonal simple interferometers was built and tested by making over 16,000 direction-of-arrival measurements. Fhe paper describes the performance of the system, giving ambiguity-resolution figures and bea ing-accuracy results. n error-reduction factor of about 4 times was obtained over narrow-aperture systems operating in similar wave-interference fields. (Author)

AD-625 944 **See Fld. 9/5**

AD-626 324 **See Fld. 9/5**

17/5. INFRARED AND ULTRAVIOLET DETECTION

AD-625 929 Fld. 17/5, 20/6
CFSTI Prices: HC $1.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
AN ACTIVE OPTICAL DEMONSTRATION DEVICE EXHIBITING RANGE CUTOFF,
by Gordon D. North. 25 Oct 65, 16p. Rept. no. TM-65-50
Proj. DA-1P222901A207 ,HDL-36100
Unclassified report

Descriptors: (*Infrared detectors, Semiconductor devices), Infrared radiation, Infrared equipment, Galium alloys, Arsenic alloys, Infrared transmitters, Infrared receivers, Diodes (Semiconductor), Transistor amplifiers, Transistors, Lenses, Preamplifiers, Optics

A simple active optical device was designed and built to demonstrate the principles of a geometric ranging optical system. The optical system consists of an objective lens and a beam splitter to provide coincidence of the source and detector beams. The depth of the region in which an object can be detected is proportional to the ratio of the height of the source image to the diameter of the lens. The maximum range of the system is proportional to the lens diameter and to the fourth root of the source radiance. The device described has a range of about 4 ft with a 2-in. F 3.5 lens, a GaAs light emitting diode as the source, and a PbS cell detector. (Author)

17/7. NAVIGATION AND GUIDANCE

AD-625 721 Fld. 17/7, 1/3, 1/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERO-ELECTRONIC TECHNOLOGY DEPT
NUCLEAR RADIATION AS A GUIDANCE TOOL. PHASE I. SHORT-RANGE ALL-WEATHER FORMATION CONTROL.
Foundational research phase rept.,
by G. E. Wilcox. 13 Dec 65, 19p. Rept. no. NADC-AE-6518
Task FR-EY-4-01
Unclassified report

Descriptors: (*Helicopters, Guidance), (*Guidance, Gamma rays), (*Gamma rays, Beacons), (*Beacons, Helicopters), All-weather aviation, Aviation safety, Formation flight, Airborne

Several effective helicopter formation control methods were devised, using a gamma radiation source on the leading craft as a guide beacon. The maximum practical range is 1000 feet, limited only by the strength of source, which could be increased at additional potential hazard to maintenance personnel. The accuracy of signal rises rapidly as the range decreases, providing an excellent collision-avoidance capability under all-weather daynight conditions. One such device was built into an aircraft-type chassis and will be operated in the dynamic environment of a helicopter for final evaluation. (Author)

AD-625 826 Fld. 17/7
CFSTI Prices: HC $2.00 MF $0.50
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
MISMATCH CORRECTION TECHNIQUES FOR TWINCHANNEL RECEIVERS.
Technical rept.,
by John J. Henderson. Aug 65, 49p. Rept. no. RRL-282 TR-12
Contract NObsr-89229 ,Nonr-1834 (02)
Unclassified report

See also AD-623 177.

Descriptors: (*Direction finding, Radio equipment), (*Radio receivers, Corrections), Navigation computers, Digital computers, Radiofrequency amplifiers, Errors, Simulation, Radio signals, Test methods, Angle of arrival, Antenna arrays, Phase measurement

The purpose was to determine, by means of system simulation with a digital computer, the magnitude of bearing error caused by receiving and amplifying the differential output voltages of a crossed-Adcock antenna array, and to examine two techniques for the improvement or elimination of this error. First, the magnitude of error in the calculated, instantaneous bearing which resulted from various degrees of receiver mismatch was determined. The interchanged amplifier technique for reducing mismatch error calculates two bearings, the first obtained with the normal system configuration and the second obtained with the two receivers interchanged, and averages them to arrive at a 'corrected' bearing. The correction signal technique applies a test or correction signal to both receivers periodically in order to determine the appropriate correction factors. Conclusion: The test signal method appears to have great versatility, stability, and accuracy. Errors can be held to very small values, even approaching zero, depending upon the frequency of test signal corrections. The method will necessarily have to be tested under actual field conditions, but this investigation indicates that favorable results should be expected.

AD-626 385 Fld. 17/7, 17/2.1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
DISPERSION OF FREQUENCIES IN THE OMEGA NAVIGATION SYSTEM.
Memorandum rept.,
by J. W. Brogden, and A. N. Duckworth. 8 Nov 65, 17p. Rept. no. NRL-MR-1661
Proj. BUSHIPS-SS-161-001-6154
Unclassified report

Descriptors: (*Radio navigation, Air traffic control systems), (*Air traffic control systems, Radio navigation), Radio signals, Phase measurement, Position finding

It has been proposed to solve the lane identification problem in the Omega navigation system by the transmission of signals at two or more frequencies to produce beat frequencies. A frequency of 13.6 kiloHertz (kHz) will be used with the basic 10.2 kHz transmissions to obtain a three-to-one increase in the width of the ambiguities. The phase velocities of waves at 10.2 kHz and 13.6 kHz are not the same, so a four-to-three relationship of wave lengths will not exist and correction factors will be required to obtain lane identification. Observations were made in an aircraft flying from the transmitting stations out to ranges of 4000 miles. The results show that calculated differences in velocity of propagation will be accurate enough to obtain reliable lane identification. The necessary corrections could be provided for the navigator in the form of simple tables. (Author)

AD-626 346 **See Fld. 9/2**

17/8. OPTICAL DETECTION

AD-626 146 Fld. 17/8, 20/6
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
ZOOM-OPTICS SURVEILLANCE DEVICE: A FEASIBILITY PROTOTYPE.
Technical paper,
by Ronald R. Kessler, John W. McCall,Jr., Paul F.Michelsen, and Robert R. Redick. Nov 65, 15p. Rept. no. RAC-TP-193
Contract SD-212
Unclassified report

Descriptors: (*Binoculars, Optical tracking), (*Optical tracking, Binoculars), (*Detection, Binoculars), Counterinsurgency, Combat surveillance, Optical equipment, Feasibility studies, Experimental design

This report describes the operating principle, design characteristics and limitations of a variable-power optics device for maintaining continuous route surveillance from a moving vehicle in such a situation and considers possible military applications of a unit of more sophisticated design.

AD-626 089 **See Fld. 17/3**

AD-626 212 **See Fld. 20/5**

AD-626 467 **See Fld. 22/3**

17/9. RADAR DETECTION

AD-625 765 Fld. 17/9
CFSTI Prices: HC $1.00 MF $0.50
MICROWAVE ASSOCIATES INC BURLINGTON MASS
HIGH POWER FERRITE GAS DUPLEXER.
Quarterly progress rept. no. 5, 11 Jun-10 Sep 65, by Fred A. Jellison. 10 Sep 65, 12p. Contract NObsr-91203 Proj. SR-008-03-01 Task 9386
Unclassified report

Descriptors: (*Radar duplexers, Ferromagnetic materials), Radiofrequency power, Yttrium compounds, Iron compounds, Garnet, Ferrites, Heat transfer, Life expectancy, Failure (Electronics)

Analysis of the test results on the second YIG-D prototype duplexer indicate that the failure is due neither to non-linear behavior with peak power nor defective epoxy bonding, but to limitations in the thermal transfer properties of the YIG-D material. Further effort to reduce the length of the final duplexer design using YIG-D material are fruitless and should concentrate on optimizing the design of the previously successful TT2-113 model. (Author)

AD-625 906 Fld. 17/9
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
QUANTITATIVE MEASUREMENTS OF RADAR ECHOES FROM AIRCRAFT, XVI. AD-4B.

Final rept.,
by R. D. Shrewbridge. 10 Jun 60, 26p. Rept. no. NRL-10072

Unclassified report

Descriptors: (*Aircraft, Radar echo areas), (*Radar echo areas, Aircraft), Radar tracking, Spectrum signatures, Radar reflections, Very high frequency, Ultrahigh frequency, Backscattering

Radar back scatter characteristics of the AD-4B aircraft are described quantitatively for frequencies of 115, 215 and 1250 Mc. At 115 Mc the nose and tail aspects yield essentially the same radar area of approximately 100 square meters; the broadside region, 315 square meters. At 215 Mc the radar areas of the nose aspects are in the order of 10 square meters; the broadside region, 200 square meters; and the tail aspects, 6 square meters. Nose aspects at 1250 Mc yield approximately 20 square meters and the tail aspects, 1 square meter. (Author)

AD-625 976 Fld. 17/9, 20/14
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS
INTRODUCTION TO RADAR CROSS-SECTION MEASUREMENTS.
Special rept., revised ed.,
by P. Blacksmith Jr., R. E. Hiatt, and R. B. Mack. 17 May 65, 27p. Rept. no. SR-37
Proj. AF-5635 Task 563502
AFCRL 65-813

Unclassified report

Revision of manuscript submitted 9 Apr 65.

Availability: Published in Proceedings of the IEEE v53 n8 p901-20 Aug 1965. Copies to DDC users only.

Descriptors: (*Radar echo areas, Measurement), Electromagnetic waves, Scattering, Radar reflections, Theory, Standing wave ratios, Doppler systems

The paper is intended to serve both as an introduction to radar cross-section measurements and as an introduction to the several measurements papers that follow in this issue. We discuss the contribution that experimental work makes to theoretical studies. The history of crosssection measurements is reviewed. Some terms are defined, and the major measurement problems are discussed. It is pointed out that the various range geometries and measurement techniques in use today were based on the approach used to solve the basic measurement problems. Some details are given of the more popular present-day measurement systems, i.e., CW, pulsed, FM-CW, Coppler, and the standing-wave ratio method. (Author)

AD-626 448 Fld. 17/9
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
STUDIES OF STROBING PERFORMANCE ON A PPI,
by R. M. Hanes, and M. V. Rhoades. 16 Oct 57, 33p. Rept. no. TG-291
Contract NOrd-7386

Unclassified report

Descriptors: (*Radar tracking, Plan position indicators), (*Plan position indicators, Radar tracking), Simulation, Errors, Training, Radar operators, Performance (Human)

A series of experiments was designed to evaluate a radar operator's ability to carry out some of the tasks required in the use of presently conceived weapons direction equipment. Positioning accuracy of the strobe dot is of the order of 1/2 to 1 mm. Positioning accuracy is very nearly as good, after only 9 hours practice, for 4 targets or 3 targets per sweep, as it is for only 1 target. Operating errors (that is, errors other than positioning errors) are reduced radically by nine hours of practice, and could probably be reduced to one or two percent with further practice, provided motivation could be maintained. Delay in tracking only 1 target is so much longer and more variable than the delay for each of 4 targets that overall error for the easier task is probably at least as great as for the more difficult. Tracking all targets (up to and including four) continuously offers advantages in tracking procedure which may well overcome the advantages of any reduction in load resulting from intermittent tracking. A discrepancy as small as 1/8 mm between rate-aided dot and target center can be detected about half the time. Discrepancies of 1/2 mm are detected very nearly 100 per cent of the time.

AD-626 592 Fld. 17/9, 9/5
CFSTI Prices: HC $3.00 MF $0.75
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
CW DETECTION TECHNIQUES.
Technical memo.,
by Edward R. Meyer, and Jean F. Bodine. 19 Nov 65, 59p. Rept. no. EDL-M794
Contract DA-28-043-AMC-00379 (E)

Unclassified report

Descriptors: (*Continuous wave radar, Radar receivers), Radar signals, Bandwidth, Search radar, Radiometers, Delay lines, Oscillators, Video amplifiers, Correlators, Circuits, Noise (Radar)

Three techniques were investigated as possible schemes for improving the detectability of a Continuous-Wave (CW) signal within a large Radio-Frequency (RF) bandwidth when a minimum of detection time is available. Each technique is compared to a conventional sweeping receiver. Two of the techniques employ post-detection integration as a means of obtaining sensitivity without imposing undue sweeping accuracy and stability that is required for predetection integration techniques. While post-detection integration is less efficient in terms of sensitivity-search rate capability, it is less complex to implement than predetection techniques. These techniques are based on the premise that by using basically less complex equipment operating in parallel channels, a system could be built that had comparable capability at a lower cost. It would also have greater reliability, even though a greater mass of equipment would be required. The other technique investigated employs a phase-coherent multiple-frequency local oscillator (LO), or picket fence, as a means of providing multiple-signal outputs that are summed coherently before detection, whereas noise outputs are summed incoherently as an attempt to improve signal detectability. (Author)

AD-625 760 **See Fld. 4/2**

AD-626 089 **See Fld. 17/3**

AD-626 526 **See Fld. 5/9**

17/10. SEISMIC DETECTION

AD-626 380 Fld. 17/10, 5/2, 8/11, 18/3
CFSTI Prices: HC $2.00 MF $0.50
DATA ANALYSIS AND TECHNIQUE DEVELOPMENT CENTER UNITED ELECTRODYNAMICS INC ALEXANDRIA VA
SEMI-ANNUAL TECHNICAL SUMMARY REPORT NO. 1, 15 OCTOBER 1961 TO 1 AUGUST 1962, FOR DATA ANALYSIS AND TECHNIQUE DEVELOPMENT CENTER,
by Frank B. Coker. 23 Aug 62, 38p. Rept. no. DATDC-28
Contract AF33 (657)-7427 ,ARPA Order-104
Proj. AFTAC-VELA T/2037

Unclassified report

Descriptors: (*Nuclear explosions, Underground explosions), (*Underground explosions, Seismology), (*Seismology, Data processing systems), (*Technical information centers, Seismology), Seismic waves, Seismographs, Earthquakes, Statistical tests, Seismometers, Site selection, Digital computers, Programming (Computers), Libraries, Information retrieval, Seismological stations

The report includes outlines of work performed on the following tasks: (A) Develop analytical techniques and analyze data prior to establishment of the data analysiss and technique development center; (B) Design and establish a data analysis and technique development center; (C) Operation of the data analysis and technique development center. Also included are appendices on the digital program status; DATDC reports submitted to date; and a list of digitized tapes.

AD-626 382 Fld. 17/10, 5/2, 8/11, 18/3
CFSTI Prices: HC $1.00 MF $0.50
DATA ANALYSIS AND TECHNIQUE DEVELOPMENT CENTER UNITED ELECTRODYNAMICS INC ALEXANDRIA VA
SEMI-ANNUAL TECHNICAL SUMMARY REPORT NO. 2, 23 AUGUST 1962 TO 15 OCTOBER 1962, FOR DATA ANALYSIS AND TECHNIQUE DEVELOPMENT CENTER,
by R. Van Nostrand. 18 Oct 62, 18p. Rept. no. DATDC-34
Contract AF33 (657)-7427 ,ARPA Order-104
Proj. AFTAC-VELA T/2037

Unclassified report

See also AD-626 380.

Descriptors: (*Nuclear explosions, Underground explosions), (*Underground explosions, Seismology), (*Seismology, Data processing systems), (*Technical information centers, Seismology), Seismic waves, Seismographs, Earthquakes, Statistical tests, Seismometers, Site selection, Digital computers, Programming (Computers), Libraries, Information retrieval, Seismological stations

AD-626 405 Fld. 17/10, 8/11, 18/3
CFSTI Prices: HC $3.00 MF $0.50
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
BIBLIOGRAPHY OF ARRAY LITERATURE.
Technical rept.
9 Nov 65, 52p. Rept. no. TR-65-114
Contract AF33 (657)-12145 Proj. AFTAC-VT/4051

Unclassified report

Supported in part by ARPA.

Descriptors: (*Seismometers, Site selection), (*Nuclear explosions, Underground explosions), (*Underground explosions, Seismology), (*Seismology, Bibliographies), Seismic waves, Monitors, Acoustics, Radio equipment, Antenna arrays, Sonar equipment, Data processing systems, Experimental data, Abstracts

A bibliography of available literature on array technology has been compiled, embracing the disciplines of seismology, acoustics, and radio. Over one hundred articles from various scientific journals are listed. Most of the articles are abstracted and are grouped according to a major category, Field of Application, and a subcategory, Character of Content. The majority of the articles were published during the period 1955-1956. (Author)

AD-626 408 Fld. 17/10, 8/11
CFSTI Prices: HC $2.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
ARRAY RESEARCH PRELIMINARY REPORT. MATRIX-MULTIPLY DETECTION PROCESSING OF ARRAY DATA.
Special rept.,
by Aaron Booker. 13 Oct 65, 28p. Rept. no. SR-8
Contract AF33 (657)-12747 ,ARPA Order-104-60

Unclassified report

Descriptors: (*Seismometers, Data), (*Detection, Seismic waves), Matrix algebra, Statistical analysis, Series, Time, Signal-to-noise ratio

AD-626 424 See Fld. 8/11

18/2. ISOTOPES

AD-626 312 See Fld. 7/5

18/3. NUCLEAR EXPLOSIONS

AD-626 147 Fld. 18/3, 18/8
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
NEUTRON CAPTURE IN THE ATMOSPHERE FROM HIGH ALTITUDE POINT SOURCES,
by J. I. Marcum. Oct 65, 29p. Rept. no. RM-4385-PR
Contract AF49 (638)-700

Unclassified report

Descriptors: (*Neutron capture, Upper atmosphere), (*Nuclear explosions, Upper atmosphere), Neutron transport theory, Neutron capture gamma rays, Resonance escape probability, Airburst, Monte Carlo method, Programming (Computers)

Results are given for the spatial and time-dependence of neutron capture from a representative fission weapon spectrum and a 14 Mev monoenergetic source at altitudes of 10 km to 48.3 km in the real atmosphere. The solutions were obtained by the use of the RAND Monte Carlo Neutron Transport Code. A reasonable approximation to the energy disposition may be simply obtained by assuming that all the energy is locally deposited. If more precise results are desired, the gamma ray component of the thermal capture process should be treated as a further radiation transport problem. (Author)

AD-626 600 Fld. 18/3, 14/2, 7/3, 7/4, +
CFSTI PricesMF $3.00
LIBRARY OF CONGRESS WASHINGTON D C SCIENCE AND TECHNOLOGY DIV
AIR FORCE SCIENTIFIC RESEARCH BIBLIOGRAPHY, VOLUME III, 1959,
by G. Vernon Hooker, Doris C. Yates, Harvey D.Brookins, and Aaron S. Dann. 1965, 705p.

AFOSR 700-3

Unclassified report

Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $4.75, D-301.45/19-2:700/v.3.

Descriptors: (*Air force research, Bibliographies), Abstracts, Mathematics, Physics, Chemistry, Physical chemistry, Solid state physics, Electronics, Aeronautics, Astronautics, Propellants, Fuels, Materials, Crystallography, Medicine, Metallurgy, Psychology

AD-625 867 See Fld. 15/3

AD-626 151 See Fld. 8/8

AD-626 380 See Fld. 17/10

AD-626 382 See Fld. 17/10

AD-626 405 See Fld. 17/10

AD-626 527 See Fld. 5/9

18/4. NUCLEAR INSTRUMENTATION

AD-626 525 See Fld. 20/8

18/7. RADIOACTIVE WASTES AND FISSION PRODUCTS

AD-626 608 See Fld. 18/8

18/8. RADIOACTIVITY

AD-626 206 Fld. 18/8, 11/6, 11/2, 9/1, +
CFSTI Prices: HC $1.00 MF $0.50
RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
RADIATION EFFECTS INFORMATION CENTER MONTHLY ACCESSION LIST, COORDINATE INDEX, PART II FOR ACCESSION LISTS FROM OCTOBER 1, 1965 TO DECEMBER 31, 1965.
10 Jan 66, 13p.

Unclassified report

Descriptors: (*Radiation damage, Materials), (*Materials, Radiation damage), (*Indexes, Radiation damage), Subject indexing, Information retrieval, Radiation chemistry, Metals, Ceramic materials, Organic materials, Polymers, Electronic equipment

The inverted concept-coordinate index is based upon terms generated in the REIC subject files. The index is cumulative throughout the year, and the staff will provide a 'dual dictionary' at the end of each contract year to facilitate the retrospective search capabilities for the accession list abstracts. The index is subdivided into four sections. The first, Radiation Environment, includes dosimetry and energy aspects of all electromagnetic and particulate radiation sources, with the exception of space radiation. Section two deals with materials, properties, secondary environment (including space environments), devices, and all other subject concepts. An author section and a generating organization section is added to this quarterly index, as sections three and four. Under each concept term in the index are listed the accession numbers of the abstracts which have been indexed by that term. Links have been added where necessary to obviate improper coordination with the resulting false retrieval.

AD-626 474 Fld. 18/8, 9/1, 11/2, 11/9
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ATOMIC SAN DIEGO CALIF
RADIATION EFFECTS ON DIELECTRIC MATERIALS.
Quarterly rept. no. 1, 1 Jun-31 Aug 65,
by R. F. Overmyer, D. K. Nichols, and V. A. J. van Lint. 17 Dec 65, 36p. Rept. no. GA-6715
Contract DA-28-043-AMC-01412 (E)
ECOM 01412-1

Unclassified report

Descriptors: (*Materials, Radiation damage), (*Radiation damage, Dielectrics), (*Dielectrics, Radiation damage), Nuclear particles, Electrical conductance, Capacitors, Polyethylene plastics, Mica, Ceramic materials, Tantalum compounds, Oxides, Gamma rays, Neutrons, Protons, Electron accelerators

The report describes the characteristics of the irradiation facilities and the instrumentation used in measuring the transient radiation effects in capacitor dielectric materials. The Accelerator Pulsed Fast Assembly and the TRIGA reactor irradiations of Mylar, mica, ceramic, and tantalum oxide dielectrics are described with some preliminary results included; however, final results await dosimetry data and computer analysis of delayed conductivity components. An effort to compare capacitor transient effects data from various sources is discussed. Analysis of the data and measurement techniques is being carried out in an attempt to resolve some of the discrepancies in reported data. A program of data comparison between General Atomic and IBM is also discussed. A Linac experiment with several mica capacitors indicated that air trapped inside small, molded-case capacitors may be the explanation for some anomalous transient effects measurements. The numerical estimates of neutron induced conductivity and charge transfer in dielectrics have been improved due to the realization that certain approximations used in the derivation cause a much smaller error than formerly supposed. A program has been outlined for verification of the theory using direct irradiation with protons of various energies. (Author)

AD-626 608 Fld. 18/8, 7/5, 18/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
RADIONUCLIDE FRACTIONATION IN AIRBURST DEBRIS,
by Edward C. Freiling, and Michael A. Kay. 20 Sep 65, 17p. Rept. no. USNRDL-TR-933
Contract AT (49-7)-1963

Unclassified report

Descriptors: (*Radioactive fallout, Airburst), (*Distillation, Fission products), Radiochemistry, Thermodynamics, Air pollution, Surface burst

Radiochemical data from fractionated samples of airburst debris are correlated logarithmically. The correlation slopes are measures of volatility. These are compared with slopes observed in the cases of high-yield surface bursts and with thermodynamic calculations of volatility. (Author)

AD-625 748 See Fld. 14/2

AD-626 133 See Fld. 20/12

AD-626 147 See Fld. 18/3

AD-626 466 See Fld. 18/10

AD-626 575 See Fld. 8/10

18/9. REACTOR ENGINEERING AND OPERATION

AD-625 852 Fld. 18/9, 7/1
CFSTI Prices: HC $1.00 MF $0.50
DEPARTMENT OF THE NAVY WASHINGTON D C
AN ION-EXCHANGER FOR OBTAINING MAKE-UP WATER FOR A REACTOR,
by V. D. Ganzha, K. A. Konoplev, V. D. Trenin, and V. T. Sharov. 1963, 4p. Rept. no. Translation-2054
TT 66-60158

Unclassified report

Trans. of an unidentified Russian article.

Descriptors: (*Light water reactors, Water supplies), (*Water supplies, Ion exchange), (*Desalination, Ion exchange), Reactor coolants, Reactor moderators, Water, Purification, USSR

A description of the design and operation is given of an ion exchange-based desalting plant designed to treat artesian water for use in the VVR-M reactor.

18/10. REACTOR MATERIALS

AD-626 466 Fld. 18/10, 18/8, 11/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
IRRADIATION EFFECTS ON REACTOR STRUCTURAL MATERIALS 1 AUGUST - 31 OCTOBER 1965,
by L. E. Steele, C. Z. SSerpan,Jr., and J. R. Hawthorne. 15 Nov 65, 29p. Rept. no. NRL-1663
Contract AT (49-5)-2110 Proj. RR007-01-46-5409 ,SF020-02-05-0858

Unclassified report

See also AD-621 867.

Descriptors: (*Reactor materials, Steel), (*Steel, Radiation damage), (*Radiation damage, Reactor materials), Power reactors, Neutron spectrum, Light water reactors, Heavy water reactors, Graphite moderated reactors, Structural parts, Brittleness, Annealing, Ductility, Pressure vessels, Notch sensitivity, Notch toughness, Heat treatment, Manganese alloys, Nickel alloys, Nickel alloys, Chromium alloys, Molybdenum alloys

The report includes the following: (1) status of reactor radiation damage surveillance programs in several power reactors, (2) the effect of neutron spectra on properties of steels exposed in light water, heavy water, and graphite-moderated reactors, (3) the alleviation of neutron embrittlement of A350-LF1 steel by thermal annealing treatment, and (4) through-thickness Charpy V-notch ductility characteristics of a 4-in. A302-B plate.

19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

AD-625 663 Fld. 19/1, 9/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
ANALYSIS OF RADIATION HAZARD NETWORKS USING ATTENUATION CONCEPTS.
Final rept.,
by Russell N. Skeeters. Nov 65, 20p. Rept. no. NOTS-TP-3900
NAVWEPS 8797

Unclassified report

Descriptors: (*Electromagnetic shielding, Explosives initiators), (*Explosives initiators, Electromagnetic shielding), (*Suppressors, Firing circuits), Attenuation, Analysis, Circuits

The requirement for suppression of RF energy in ordnance ignition circuits may be stated in terms of the insertion loss of the network, which, inserted between the source (the equivalent generator) and the load (the resistance of the electroexplosive device, or EED), will limit RF energy at the EED to the tolerable level. The optimum theoretical treatment of RF suppression deals with the minimum of parameters and involves the minimum of mathematical difficulty. This report presents a method of analysis consistent with these goals. Simple formulas are given for computing insertion loss with a generator of known characteristics, and for computing the minimum insertion loss with a generator of variable or unknown characteristics. (Author)

AD-625 911 Fld. 19/1, 13/9
CFSTI Prices: HC $2.00 MF $0.50
DREXEL DYNAMICS CORP HORSHAM PA
THE DESIGN AND FABRICATION OF A CLOTH INSERTING MACHINE WITH OPTIMUM AUTOMATION.
Final rept.,
by H. C. McMillan. 15 Dec 65, 45p. Rept. no. rep-2630-3300
Contract DA-36-034-AMC-0298A

Unclassified report

Descriptors: (*Ammunition, Industrial equipment), (*Machines, Powder bags), Automation, Production, Cartridge cases, Textiles, Adhesives, Systems engineering, Heat treatment, Operation, Costs

The report describes the design and fabrication of a automated cloth inserting machine for shell cases.

AD-626 170 Fld. 19/1
CFSTI Prices: HC $2.00 MF $0.50
FELTMAN RESEARCH LABS PICATINNY ARSENAL DOVER N J
THE EFFECTS OF PROCESSING ON PYROTECHNIC COMPOSITIONS. PART III: DIMENSIONAL EFFECTS OF PAPER CASES ON ILLUMINANCE AND BURNING RATE OF FLARE COMPOSITIONS.
Technical rept.,
by Doris E. Middlebrooks, Seymour M. Kaye, and Gary Weingarten. Jan 66, 27p. Rept. no. TR-3275
Proj. DA-504-01-207

Unclassified report

Descriptors: (*Flares, Containers), (*Pyrotechnics, Processing), Illumination, Burning rate, Magnesium, Sodium compounds, Nitrates, Vinyl plastics, Paper, Light, Intensity, Thickness

A study was conducted to evaluate the effects of changes in the dimensions of the paper cases on the burning rate and illuminance characteristics of flares. Magnesium/ sodium nitrate/vinyl alcohol acetate resin flares of compositions containing magnesium of three different mesh sizes were blended and loaded into paper cases having two internal diameters and three wall thicknesses. The flares were tested using a photocell-recorder combinationnd a light integrator which records luminous intensity as a function of burning time. In addition, motion pictures were taken of each test, at 24 frames per second. The luminosity and photographic results revealed that the paper cases were shielding the light radiation of the small diameter (0.62 inch ID) flares, the thick-walled items being affected more than the thin. This obscuration of light was shown more significantly by the coarse (30/50 mesh) magnesium system. The burning rate data for the small diameter cases and both the illuminance and burning rate data for the large diameter (1.33 inch ID) cases showed no variation which could be attributed to the difference in case thickness. (Author)

AD-626 189 Fld. 19/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y
AN EXPLORATORY INVESTIGATION INTO THE POLARITY STABILITY OF THE ELECTROSTATIC CHARGE ON AN IN-FLIGHT PROJECTILE.
Technical rept.,
by Morris L. Groder. Jul 65, 40p. Rept. no. NAVTRADEVCEN-1H-30

Unclassified report

Descriptors: (*Projectiles, Electrostatics), (*Electrostatics, Polarization), Stability, Rifles, Inertia, Thermal properties, Projectors (Ordnance), Pistols

The paper describes exploratory experiments performed to determine the effects of gun barrel temperature on the stability of an in-flight bullet's natural electrostatic charge. The data derived from these exploratory experiments indicate that (1) there is a correlation between the polarity (negative-positive-zero) stability of the projectile's electrostatic charge and the thermal inertia effects in the rifle; (2) discrete mobile signal phenomena exist as a function of the thermal conditions in the launcher; and (3) it is possible to predict and/or control specified characteristics of the electrostatic charge on an in-flight projectile. (Author)

AD-625 717 See Fld. 13/4

AD-626 171 See Fld. 21/9

AD-626 415 See Fld. 19/4

19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

AD-626 124 Fld. 19/4, 11/6
CFSTI Prices: HC $3.00 MF $0.75
WATERTOWN ARSENAL MASS
CORRELATION OF MICROSTRUCTURE AND BALLISTIC PROPERTIES OF ARMOR PLATE,
by E. L. Reed, and S. L. Kruegel. 11 Jul 38, 66p. Rept. no. 710/261

Unclassified report

See also AD-626 126.

Descriptors: (*Armor plate, Microstructure), (*Terminal ballistics, Armor plate), Fracture (Mechanics), Steel, Chromium alloys, Molybdenum alloys, Vanadium alloys, Nickel alloys, Silicon alloys, Manganese alloys, Carbides, Impact tests, Hardness, Martensite, Tungsten alloys

Results are based on normal impact of caliber .30 armor piercing ammunition upon plate, 1/2 in and lighter, shock test data not being available. Heavier plate was tested only with caliber .50 A.P., with the exception of two 1 in plates which were tested with 37 mm. M39 solid shot. Laminations of any considerable extent are a primary cause of spalling in plate of passable ballistic limit. Carbides (or any other segregates which may be revealed by a Murakami etch) in definite chains in grain boundaries produce spalling. Martensitic structure invariably caused spalling, while a fairly uniform troostitosorbitic structure was found in the majority of high ballistic nonspalling plate. Eliminating all plate with laminations, bad carbide conditions and nonuniform nital structure, Brinell hardnesses from 418 to as high as 444 were found to produce the highest ballistic plate which did not spall under the caliber .30 A.P. tests to which they were subjected. Macro segregations in the form of banding (in the absence of elongated nonmetallic inclusions) were found in both high and low ballistic plate. (Author)

AD-626 126 Fld. 19/4, 11/6
CFSTI Prices: HC $2.00 MF $0.50
WATERTOWN ARSENAL MASS
THE RELATION OF MICROSTRUCTURE TO THE BALLISTIC PROPERTIES OF HOMOGENEOUS ARMOR PLATE,
by E. L. Reed. 31 Dec 36, 47p. Rept. no. 710/79

Unclassified report

See also AD626 124.

Descriptors: (*Armor plate, Microstructure), (*Terminal ballistics, Armor plate), Fracture (Mechanics), Steel, Chromium alloys, Molybdenum alloys, Vanadium alloys, Hardness, Titanium alloys, Nickel alloys, Silicon alloys, Manganese alloys, Impact tests, Carbides

An investigation was made to determine the relation of microstructure to the ballistic properties of homogeneous armor plate. (Author)

AD-626 415 Fld. 19/4, 19/1
CFSTI Prices: HC $1.00 MF $0.50
BUREAU OF MINES PITTSBURGH PA
STRESS WAVES IN BOUNDED MEDIA.
Quarterly rept. 1 Sep-30 Nov 65,
by Richard W. Watson, Karl R. Becker, and Frank C. Gibson. 7 Jan 66, 19p.

Unclassified report

Descriptors: (*Explosive materials, Impact shock), (*Metal plates, Stresses), Geometric forms, Tests, Firing tests (Ordnance), Explosion effects

The program to determine the factors affecting the energy transferred from detonating explosives to coupled metal plates was continued. The variables under consideration include the properties of the explosive as well as the choice of the materials in the explosive-plate combination. The latter involves the shock impedance match between the explosive and metal plate, as well as the effects of charge geometry and the degree of coupling between the explosive andd the plate. An effort was made to improve the precision of the observations. In addition, several groups of firings were completed using five explosives in combination with four different plate materials. The results of these tests are discussed.

AD-626 541 Fld. 19/4
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF ENGINEERING MECHANICS
THEORETICAL ANALYSIS OF INTERNAL BLAST WAVES IN SPHERES.
Quarterly progress rept. no. 11, 1 Jul-30 Sep 64,
by Norman Davids. 30 Sep 64, 4p. Contract DA-36-034-ORD-3576-RD
Unclassified report

Descriptors: (*Spheres, Shock waves), (*Shock waves, Propagation), Blast, Loading (Mechanics), Plastics, Computers

The report concerns a theoretical study on the propagation of waves produced by an explosion in a spherical cavity in a metal. A purpose of such a study is to help find reliable criteria for extrapolating internal blast loading behavior to larger spherical containers. This study is being done concurrently with an experimental investigation on 7 in. and 10 in. aluminum spheres. The scope of the project includes an experimental program in blast waves in plastics. (Author)

AD-625 804 See Fld. 21/2

19/5. FIRE CONTROL AND BOMBING SYSTEMS

AD-626 416 See Fld. 16/4

19/6. GUNS

AD-625 893 Fld. 19/6, 13/8
CFSTI Prices: HC $1.00 MF $0.50
ROCK ISLAND ARSENAL ILL
RE-PROCESSING OF CALIBER .50 MACHINE GUN RECEIVERS,
by H. L. Faigen. 14 Apr 44, 7p. Rept. no. RIAL-44-1824
Unclassified report

Descriptors: (*Machine guns, Maintenance), Corrosion inhibition, Phosphate coating, Cleaning, Anodic coating, Processssing

AD-626 172 Fld. 19/6
CFSTI Prices: HC $2.00 MF $0.50
SPRINGFIELD ARMORY MASS
ENGINEERING EVALUATION TEST OF THE M73 MACHINE GUN WITH FIXED EJECTOR.
Technical rept.,
by A. H. Tuttle. 12 Nov 65, 34p. Rept. no. SA-TR3-1909
Proj. 4727464
Unclassified report

Descriptors: (*Machine guns, Tests), Performance (Engineering), Ejectors (Ordnance), Reliability, Firing tests (Ordnance), Costs, Cartridge cases

The performance of two M73 machine guns, modified to incorporate a fixed ejector system, was evaluated and the reliability of function of these weapons was compared with that of the standard M73 weapon of current production. The following engineering tests were conducted: preliminary acceptance, heat, cold, simulated tank, sustained firing, elevated firing, depressed firing, ejection, rain, and dust. Based upon the functional results of the limited number of weapons used in these tests, the fixed ejection system is not superior to the standard system. The fixed ejection system, however, has two favorable characteristics: (1) the ultimate reduction of manufacturing cost due to fewer required parts and (2) the inherent advantage of stoppage clearances by immediate-action procedure. Test procedures are described and results discussed. (Author)

20/1. ACOUSTICS

AD-625 734 Fld. 20/1
CFSTI Prices: HC $2.00 MF $0.50
MITRE CORP BEDFORD MASS
THE MUSE SYSTEM: DESCRIPTION AND MANUAL FOR OPERATION,
by A. W. Slawson. Dec 65, 49p. Rept. no. TM-03913
Contract AF19 (628)-2390 Proj. AF-1700
ESD TR-65-94
Unclassified report

Descriptors: (*Sound, Synthesis), (*Programming (Computers), Sound), (*Speech, Synthesis), Digital-toanalog computers, Simulation, Instruction manuals, Sound generators, Sound reproduction systems, Voice communication systems, Punched cards, Acoustic filters, Resonance, Difference equations

The MUSE system, an IBM 7090 computer program and associated conversion equipment, has been designed for use as a found synthesizer. Concise descriptions of complex sounds including human speech are converted by the MUSE system into sound pressure waveforms. The inputs to the MUSE system are specifications of the changing resonance frequencies of multiple acoustic filter networks and of the changing frequencies and amplitudes of the sources of acoustic energy that excite those networks. The output of the MUSE system is a sampled waveform calculated for each resonance by the solution of a second-order difference equation. The results are summed over a single system of resonances and then the resonance systems are also added together. The resulting string of sampled waveform ordinates is written in digital form on magnetic tape. Conversion to a voltage waveform is accomplished by use of the standard IBM 729 IV tape transport unit and a simple digital-to-analog converter. Although the quality of the sound is somewhat degraded by tape wow and flutter, acceptable and highly intelligible speech has been synthesized. (Author)

AD-625 793 Fld. 20/1
CFSTI Prices: HC $2.00 MF $0.50
CATHOLIC UNIV OF AMERICA WASHINGTON D C
PULSED CREEPING WAVES IN ACOUSTICS.
Rept. on Underwater Acoustics Program,
by H. Uberall, R. D. Doolittle, and J. V. McNicholas. Jun 65, 36p. Rept. no. 1-65
Contract Nonr-2249 (08)
Unclassified report

Descriptors: (*Underwater sound, Scattering), Mathematical analysis

The phenomenon of diffraction of acoustic and electromagnetic waves by finite or semi-finite obstacles has been interpreted, mainly following the classical paper by Franz, in terms of damped waves which, starting out at the boundary of the geometrical shadow, encircle the body any number of times ('creeping waves'). In acoustics, the sound velocity is small enough so that with sound pulses of sufficiently short duration, the individual creeping waves may be followed around the obstacle directly, whereas in the electromagnetic case, only steady-state interference effects can mainly be observed. The present work is a study of the diffraction of plane-wave sound pulses of arbitrary shape, including their geometrical reflection from the vertex, and their propagation on both the shadow and the insonified surface of the body, as well as their observation at large distances. The special example of an infinitely long, acoustically soft circular cylinder of not too small radius is used, but an extension to other simple cases is possible. (Author)

AD-626 017 Fld. 20/1
MICHIGAN STATE UNIV EAST LANSING DEPT OF PHYSICS
THE PROPAGATION OF HIGH AMPLITUDE SOUND WAVES.
Technical rept.,
by Bill D. Cook, W. R. Klein, W. G. Mayer, C. B. Tipnisand , and E. A. Hiedemann. Oct 65, 26p. Rept. no. TR-15
Contract Nonr-2587 (01) Proj. NR-384-304
Unclassified report

Availability: Published in Various reprints. Copies to DDC users only.

Descriptors: (*Ultrasonic radiation, Diffraction), Diffraction gratings, Light, Harmonic analyzers, Optical analysis, Difference equations, Propagation, Wave analyzers

Contents: An optical method for ultrasonic waveform analysis using a recurrsion relation, Light diffraction by ultrasonic gratings, Experimental study of fraunhofer light diffraction by ultrasonic beams of moderately high frequency at oblique incidence, Light diffraction by ultrasonic beams of high frequency near bragg incidence.

AD-626 091 Fld. 20/1
CFSTI Prices: HC $2.00 MF $0.50
AVCO MARINE ELECTRONICS OFFICE NEW LONDON CONN
VOLUME REVERBERATION FROM DEEP SCATTERING LAYERS,
by R. R. Hartley, A. C. Vasiloff, W. L. Konrad, and G. H. Bowers,Jr.. 1 Oct 65, 36p. Rept. no. MED-65-1001
Contract Nonr-3353 (00)
Unclassified report

Descriptors: (*Underwater sound, Scattering), (*Acoustics, Underwater sound), Sonar, Underwater explosions, Sound transmission, Mediterranean Sea, Caribbean Sea

This report summarizes a year-long study of underwater sound volume reverberation by AVCO. During this time, data from the Mediterranean, Bermuda and Bahama areas were collected and reduced in terms of volume scattering strength per unit area, or volume scattering coefficients. The dependence of the results on such parameters as frequency, elevation angle, local time and layer depth is given. The results are compatible with those of other investigations in the field. (Author)

AD-626 438 Fld. 20/1
CFSTI Prices: HC $1.00 MF $0.50
J G ENGINEERING RESEARCH ASSOCIATES BALTIMORE MD
FARFIELD PRESSURE OF RANDOMLY VIBRATING STRUCTURES OVER GIVEN FREQUENCY BANDS.
Technical rept.,
by Joshua E. Greenspon. Oct 65, 14p. Rept. no. TR-13
Contract Nonr-2733 (00) (FBM) Proj. NR-185-300
Unclassified report

Descriptors: (*Sound, Field theory), (*Field theory, Sound), Underwater sound, Sound transmission, Structures, Vibration, Hulls (Marine), Numerical analysis, Green's function, Cylindrical bodies

A relation between the cross spectral density of the farfield pressure outside a surface surrounding a sound source is given in terms of cross spectral density of the normal acceleration over a surface surrounding the source; the cross spectral density of the acceleration is given in terms of the modes of the structure. A resulting multipole expansion for the mean square farfield pressure in low frequency bands is derived using a free field Green's Function. An expression for the magnitude and directivity of the farfield mean square pressure from various types of motions in any frequency band is obtained. (Author)

AD-626 094 See Fld. 20/2

AD-626 113 See Fld. 8/7

AD-626 130 See Fld. 6/3

AD-626 542 See Fld. 20/3

20/2. CRYSTALLOGRAPHY

AD-625 786 Fld. 20/2, 11/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INVESTIGATION OF THE PROCESS OF CATALYZED CRYSTALLIZATION BY THE METHOD OF COMBINATION LIGHT DIFFUSION SPECTRA,
by Ya. S. Bobovich. 28 Sep 65, 11p. Rept. no. FTD-TT-65-689
TT 66-60134
Unclassified report

Unedited rough draft trans. mono. Stekloobraznoe Sostoyanie. No. 1, Kataliziravannaya Kristallizatsiya Stekla 1963 p87-90.

Descriptors: (*Crystallization, Catalysis), (*Spodumene, Crystallization), (*Glass, Crystallization), Titanium compounds, Dioxides, Light, Diffusion, Spectroscopy

AD-625 834 Fld. 20/2
CFSTI Prices: HC $1.00 MF $0.50
MARTIN CO ORLANDO FLA
STACKING FAULTS.
Final rept.,
by Ralph P. I. Adler, and Henry M. Otte. Dec 65, 16p. Rept. no. OR-6891
Contract Nonr-3706 (00) Proj. NR-031-693
Unclassified report

Descriptors: (*Crystal lattice defects, X-ray diffraction analysis), (*X-ray diffraction analysis, Crystal lattice defects), Electron diffraction analysis, Electron microscopy, Twinning (Crystallography), Brass, Silicon, Niobium, Tantalum, Cerium, Uranium, Carbon, Boron

All original experimental, analytical, and theoretical work performed on Stacking Faults in Crystalline Materials is summarized. Highlights of this project are listed and references are made to publications in the open literature, abstracts, discussions, and invited presentation where details are elaborated. Experimental work was primarily performed using X-ray diffraction and electron microscopy techniques. Materials investigated included 70:30 brass, Cu-6.6 atomic percent Si, niobium, tantalum, cerium, alpha-uranium, carbon, and boron. Theoretical and analytical studies were also performed to identify the contribution of faults, twins and thin platelets to diffraction phenomena and to standardize the terminology in indexing the hexagonal system. (Author)

AD-626 041 Fld. 20/2, 7/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
THE CRYSTAL STRUCTURE OF THE 1:1 COMPLEX OF 7,7,8, 8-TETRACYANO QUINODIMETHAN, AND N,N,N', N'-TETRAMETHYL-P-PHENYLENEDIAMINE,
by A. W. Hanson. 15 Feb 65, 4p. Rept. no. NRC-8660
Unclassified report

Availability: Published in Acta Crystallographica v19 pt4 p610-3 Oct 1965. Copies to DDC users only.

Descriptors: (*Complex compounds, Crystal structure), (*Organic nitrogen compounds, Crystal structure), Nitriles, Monocyclic compounds, Amines, Molecular association, Least squares method, Canada

The crystal is monoclinic, probably C2/m, with a=9.88, b=12.71, c=7.72 A, beta=97.34 degrees, Z=2. The structure was deduced from a three-dimensional Patterson synthesis, and refined by block-diagonal least squares. The constituent molecules partially overlap each other with an interplanar spacing of 3.27A. Other intermolecular distances are consistent with van der Waals interaction. (Author)

AD-626 083 Fld. 20/2, 7/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
X-RAY CRYSTALLOGRAPHY OF THE PHENYLTRIPHOSPHONITRILES
.I. THE CRYSTAL STRUCTURE OF 2,2-DIPHENYL-4,4,6,6 TETRACHLORO CYCLOTRIPHOSPHAZATRIENE,
by N. V. Mani, F. R. Ahmed, and W. H. Barnes. 15 Mar 65, 6p. Rept. no. NRC-8674
Unclassified report

Availability: Published in Acta Crystallographica v19 pt5 p693-8 Nov 1965. Copies to DDC users only.

Descriptors: (*Organic phosphorus compounds, Crystal structure), (*N-heterocyclic compounds, Crystal structure), Phosphonitrile chlorides, Monocyclic compounds, X-ray diffraction analysis, Fourier analysis, Least squares method, Stereochemistry

The crystal structure of 2,2-diphenyl 4,4,6,6-tetrachloro cyclotriphosphazatriene, (C6H5) 2C14P3N3, was determined from Patterson and Fourier syntheses using threedimensional counter data. The parameters were refined by differential and least-squares methods, and the hydrogen atoms have been located from difference maps. The R index is 0.04 sub 8 for 2529 observed reflections. The space group is P2 sub 1/n, and the cell constants are a = 10.653, b = 13.223, c = 12.776 A, beta = 94 degrees 54'. The six-membered cyclotriphosphazatriene (cyclophosphazene) ring has a slight chair form with three pairs of P-N bonds of different lengths averaging 1.555, 1.578, 1.615A. The exocyclic bond angle C-P-C is larger than either of the Cl-P-Cl angles by about 4.1 degrees, while the corresponding internal bond angle N-P-N is smaller than either of the other two N-P-N angles by about 4.5 degrees. The P-N-P angles are 119.2 degrees, 121.7 degrees, and 122.4 degrees. The mean C-C bohd in each of the two phenyl rings is only 1.377A. (Author)

AD-626 094 Fld. 20/2, 20/1
UPPSALA UNIV (SWEDEN) DEPT OF PHYSICS
STUDY OF THE BORDONI PEAK IN A SILVER SINGLE CRYSTAL,
by M. Mongy, K. Salama, and O. Beckman. 5 Sep 64, 8p. Contract AF-EOAR-53-63
AFOSR 65-1894
Unclassified report

See also AD-621 313.

Availability: Published in Nuovo Cimento, v36 n10-7 1 Mar 1965. Copies to DDC users only.

Descriptors: (*Silver, Acoustic properties), (*Ultrasonic radiation, Absorption), Single crystals, Relaxation time, Phonons, Crystal lattice defects, Temperature

The Bordoni peak was investigated in the (100), (111) and (110) orientations of a silver single crystal. The measurements were made at frequencies 10, 20 and 50 MHz in the temperature range 80 to 300K. The activation energies and the relaxation frequencies are found to be different from one orientation to the other; the minimum values are obtained when the ultrasonic waves are applied parallel to the (100) direction. The comparison of the peak with Zener's single relaxation theory shows that the peak in the (100) direction is due to a single relaxation process. In the other two directions, the results favour a spectrum of different relaxation frequencies with a constant activation energy. The values of the activation energy and the relaxation frequency characterizing the single relaxation process are compared with those previously obtained in copper. The results of both metals are discussed in view of Seeger's theory. (Author)

AD-626 123 Fld. 20/2, 12/1
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
INTEGRITY BASES FOR A SYMMETRIC TENSOR AND A VECTOR- THE CRYSTAL CLASSES,
by G. F. Smith, M. M. Smith, and R. S. Rivlin. 9 Apr 62, 41p. Contract NSF-G-11567
Unclassified report

Availability: Published in Archive for Rational Mechanics and Analysis v12 n2 p93-133 1963. Copies to DDC users only.

Descriptors: (*Symmetry (Crystallography), Groups (Mathematics)), (*Vector analysis, Crystal structure), (*Tensor analysis, Crystal structure), Matrix algebra, Transformations (Mathematics), Invariance

Integrity bases are derived for a symmetric seconorder tensor and a vector for the transformation groups corresponding to each of the crystal classes. In each case the irreducibility of the integrity basis is proven. (Author)

AD-626 369 Fld. 20/2, 20/12, 20/10
CALIFORNIA UNIV LA JOLLA DEPT OF PHYSICS
THE THEORY OF CORRELATED CRYSTALS,
by Keith A. Brueckner, and Jobst Frohberg. 28 Jun 65, 18p. Contract DA-31-124-ARO (D)-257

AROD 5133:26
Unclassified report

Availability: Published in Progress of Theoretical Physics, Suppl. Extra Number p383-99 1965. Copies to DDC users only.

Descriptors: (*Crystals, Theory), (*Cryogenics, Crystals), (*Approximation (Mathematics), Crystals), Wave functions, Perturbation theory, Equations

The theory of the correlated crystal is developed using two alternative methods. The first method is based on a variational wave function and requires the development of a cluster expansion which has a number of features peculiar to the crystal. The second approximation method starts from the Raleigh-Schrodinger perturbation theory in the Hartree basis representation and by selective summation in the perturbation series, and develops results very similar to the cluster expansion. Previous results and the degree of their validity are discussed, as evident from the developments of the proposed theory. Consideration is given to the solution of the generalized equation developed and various approximations suitable for explicit evaluation are exhibited.

AD-626 400 Fld. 20/2, 7/5, 20/12
MICROWAVE LAB STANFORD UNIV CALIF
FLUORESCENCE OF MG:CR (+3) IONS IN NONCUBIC SITES,
by G. F. Imbusch, A. L. Schawlow, A. D. May, and S. Sugano. 7 May 65, 10p. Rept. no. ML-1389
Contract DA-31-124-ARO (D)-208
AROD 3780:3
Unclassified report

Availability: Published in The Physical Review v140 n3A pA830-8 Nov 1 1965. Copies to DDC users only.

Descriptors: (*Magnesium compounds, Oxides), (*Chromium, Fluorescence), (*Fluorescence, Chromium), Line spectrum, Ions, Crystal structure, Dipole moments, Atomic orbitals, Stresses

In addition to the R line at 6981 A, the fluorescence spectrum of MgO:Cr (3+) contains a number of sharp lines in the region between 6981 and 7040 A. The strongest of these are identified, by their splitting under axial stress, with ions in sites of tetragonal symmetry. Such tetragonal symmetry at the ion site can be produced by an adjacent magnesium-ion vacancy. The vacancy also produces some hemihedral field at the chromium ion, and so the transitions from these chromium ions need not be purely magnetic-dipole. They are found to have also some electric-dipole character. Lines from pairs of chromium ions, with a small exchange interaction, are also identified. (Author)

AD-626 495 Fld. 20/2, 20/6, 20/12
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY
THEORY OF OPTICAL ABSORPTION BY VIBRATION OF DEFECTS IN DIAMOND,
by R. J. Elliott, and P. G. Dawber. 1963, 9p.
Contract AF-AFOSR-611-64
AFOSR 65-1967

Unclassified report

Availability: Published in Lattice Dynamics Proceedings of the International Conference p479-84 Copenhagen, Denmark Aug 5-9 1963. Copies to DDC users only.

Descriptors: (*Crystal lattice defects, Diamond), (*Diamond, Optical properties), Absorption, Phonons, Vibration, Symmetry (Crystallography)

The optical absorption due to the creation of single phonons is calculated for the perturbed vibrations around a defect of a type thought to occur in type I diamonds. A simple model is taken for the defect consisting of a single layer of nitrogen atoms in a (100) plane, sharing their extra electron with a neighboring layer of carbon atoms. Using as a parameter the weakening of the force constant between these layers, reasonable agreement is achieved with the strongest observed peaks. Some other aspects of the spectrum indicate, however, that the model is not completely adequate. (Author)

AD-626 516 Fld. 20/2
WESTERN AUSTRALIA UNIV PERTH
A STRUCTURAL MODEL OF THE RARE-EARTH OXIDES RO- (R = CE. PR, TB: 1.5< X <2.0),
by B. G. Hyde, D. J. M. Bevan, and LeRoy Eyring. 1965, 4p. Contract AF-AFOSR-853-65
Proj. 9760 Task 976001
AFOSR 65-2090

Unclassified report

Availability: Published in International Conference on Electron Diffraction and Crystal Defects, Melbourne p11 C-4 1965. Copies to DDC users only.

Descriptors: (*Rare earths, Crystal structure), (*Cerium compounds, Oxides), (*Promethium compounds, Oxides), (*Terbium compounds, Oxides), Phase studies, Crystal lattice defects, Electron diffraction analysis, Australia

A plausible but unconfirmed model for the structures of the ordered, intermediate rare-earth oxide phases RnO2n-2 is presented, and extended so as to account for the structure and behaviour of the (disordered) nonstoichiometric phases RO1.5+x, RO2-y. All the proposed defect structures may be regarded as deriving from ordered arrangements of anion 'vacancies' in a parent fluorite lattice. (Author)

AD-626 597 Fld. 20/2, 7/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
STRUCTURE OF ORGANIC CRYSTALS: ANNOTATED BIBLIOGRAPHY.
Rept. no. 2 on ATD work assignment no. 79, task 29,
by Victor Seemann. 30 Dec 65, 20p. Rept. no. atd-65-104
TT 66-60263

Unclassified report

Bibliography based on Soviet open-source materials for 1964. Appendices 1 and 2 are indices of authors and associations respectively. Rept. on Surveys of Soviet Scientific and Technical Literature.

Descriptors: (*Organic compounds, Crystal structure), (*Crystal structure, Bibliographies), USSR

The annotated bibliography was compiled from Soviet open sources published in 1964. It is the second in a series and entries are arranged alphabetically by author. Articles dealing with electron microscopy were not included. 53 entries contain brief annotations indicating the method of investigation, equipment used, etc. Materials investigated include: dinitronaphtalene, quasiaromatic copper complexes, alpha-pinene molecules, polyacrylonitrile, diacidodiethylenediamine compounds, viscose cord fiber, pepsin, liquid crystals, Rochelle salt, polytrifluorochloroethylene, 1-phenylalanine hydrochloride, biferrocenyl structure, polybenzimidazoles, pentaerythritol dinitroalkanes, diurenes, diguanidines, cellulose nitrates, dicyandiamide, cellulose ethers, polypropylene spherulites, ferrocenedisulfonyl chloride, stearates of Co (II) and Ni (II), and diphenylmercury. There are two Appendixes: 1. Author index, and 2. Association index. (Author)

AD-626 629 Fld. 20/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
THERMOELASTIC PROPERTIES OF SOME CUBIC CLOSE-PACKED LATTICES,
by T. H. K. Barron, and M. L. Klein. 13 Nov 64, 27p.
NRC 8335

Unclassified report

Prepared in cooperation with Bristol Univ. (England). Dept. of Pure Physics. Revision of manuscript submitted 29 Sep 64.

Availability: Published in Proceedings of the Physical Society v85 p533-58 1965. Copies to DDC users only.

Descriptors: (*Helium group gases, Thermal properties), Canada, Elasticity, Crystal lattices, Solids, Crystals, Numerical analysis, Strain (Mechanics), Argon, Krypton, Neon, Xenon, Cryogenics, High temperature research, Potential theory

A method is described whereby the strain-dependence of the first few even moments of the vibrational frequency distribution of a crystal can be used to calculate the elastic constants of moderately anharmonic crystals. From the elastic constants at T = 0 the limiting Debye temperature can also be obtained, to the first approximation in the anharmonicity. Detailed calculations at T = 0 are carried out for cubic close-packed lattices with a number of different central force potentials. The results are applied to the thermoelastic properties of the rare gas solids. With parameters chosen to fit the molar volume and cohesive energy, both allneighbour and nearest-neighbour 6-12 models give bulk moduli at T = 0 in good agreement with experimental values for Xe and Ne; the predicted value for Kr is 3.21 (=5%) x 10 to the 10th power dyn/sq cm -2, and for Ar 2.61 (=5%) dyn/sq cm. Close agreement is obtained with a recent measurement of the transverse wave velocity in polycrystalline argon. Anharmonic corrections to quasi-harmonic values for Debye temperature are found to be positive, being approximately 1 1/2%, 2%, 4% and 16% for Xe, Kr, Ar and Ne respectively. At high temperatures formal expressions are derived for the adiabatic and isothermal elastic constants, but their evaluation requires a rather uncertain extrapolation.

AD-625 704 See Fld. 7/4

AD-625 758 See Fld. 7/2

AD-625 772 See Fld. 20/6

AD-625 829 See Fld. 11/6

AD-625 967 See Fld. 11/6

AD-625 968 See Fld. 11/6

AD-625 970 See Fld. 7/4

AD-626 212 See Fld. 20/5

AD-626 410 See Fld. 11/6

AD-626 530 See Fld. 20/12

AD-626 532 See Fld. 20/12

AD-626 533 See Fld. 20/12

AD-626 534 See Fld. 20/12

AD-626 535 See Fld. 20/12

AD-626 536 See Fld. 20/12

AD-626 537 See Fld. 20/12

AD-626 538 See Fld. 20/12

AD-626 539 See Fld. 20/12

AD-626 540 See Fld. 20/12

AD-626 600 See Fld. 18/3

AD-626 648 See Fld. 20/12

20/3. ELECTRICITY AND MAGNETISM

AD-625 671 Fld. 20/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
THE LORENTZ FORCE,
by P. Penfield,Jr.. 17 May 65, 1p. Contract DA-36-039-AMC-03200 (E)

Unclassified report

Availability: Published in the Proceedings of the IEEE, v53 n8 p1144 Aug 1965. Copies to DDC users only.

Descriptors: (*Charged particles, Force (Mechanics)), (*Force (Mechanics), Magnetic fields), Field theory, Velocity, Ferromagnetism, Electric fields

It is shown that both the Minkowski and Chu forms of the Lorentz force density on a swarm of electrons in electric and magnetic fields are valid.

AD-625 674 Fld. 20/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
RESISTANCE OF AN N-DIMENSIONAL CUBE,
by O. J. Tretiak, and T. S. Huang. 25 Jun 65, 1p. Contract DA-36-039-AMC-03200 (E) Grant , NSF-GP-2495

Unclassified report

Availability: Published in Proceedings of the IEEE v53 n9 p1271-2 Sep 1965. Copies to DDC users only.

Descriptors: (*Resistance (Electrical), Mathematical analysis), Geometric forms, Electrical networks

The authors derive an expression for the resistance across the two opposite vertices of an n-dimensional cube each edge of which is a one-ohm resistance.

AD-625 709 Fld. 20/3, 11/6, 20/12
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF PHYSICS
MAGNETIC RELAXATIONAL BEHAVIOUR OF MULTILAYER NICKEL FILMS,
by A. A. Hirsch, N. Friedman, and Z. Eliezer. 31 Jul 64, 4p. Contract AF-EOAR-71-63 Proj. AF-9763 Task 976 302
AFOSR 65-1895

Unclassified report

Availability: Published in Physica v30 p2314-6 1964.

Descriptors: (*Metal films, Magnetic properties), Ferromagnetic materials, Films, Substrates, Nickel, Copper, Laminates, Aluminum, Vapor plating, Vacuum apparatus

A discussion is presented of the magnetic properties of multilayer films composed of very thin laminations of ferromagnetic metals, starting from the viewpoint of a superparamagnetic state. The film investigated were obtained by depositing alternatively at room temperature layers of nickel and copper in a vacuum of 0.00001 mm Hg on to substrates made of aluminum foils (70 mm x 100 mm x 0.01 mm). The layers of each metal were of the same thickness. The dependence of the coercive force on the mean distance between the nickel layers of the films indicates that the magnetic interaction between the different layers of the films cannot be neglected in a theoretical interpretation of the remagnetization of multilayer films with superparamagnetic behavior, as is normally done in the case of fine non-interacting particles, the remagnetization of which is discussed by means of a Langevin function.

AD-625 930 Fld. 20/3, 20/13
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
LOW-TEMPERATURE BEHAVIOR OF THE HEISENBERG FERROMAGNET,
by Michael Wortis. 30 Dec 64, 20p. Contract AF-AFOSR-130-63
AFOSR 65-2189

Unclassified report

Prepared in cooperation with Paris Univ. (France). Faculte des Sciences.

Availability: Published in The Physical Review v138 n4 pA1126-45 May 17 1965. Copies to DDC users only.

Descriptors: (*Ferromagnetism, Spin), (*Lowtemperature research, Ferromagnetism), Thermodynamics, Field theory, Perturbation theory, Equations of state, Power series, Green's function, Hamiltonian, Bosons, Operators (Mathematics), Statistical mechanics

The mechanics of spin deviations is formulated in a simple manner, which maintains the true spin kinematics and does not involve the introduction of any artificial interactions. A virial expansion for the thermodynamics, based on this mechanics, clearly distinguishes kinematical and dynamical effects. At low temperatures, low-density kinematical effects are easily proved exponentially small. The second virial coefficient is computed unambiguously. Dyson's low-temperature free energy is straightforwardly rederived, and an upper bound is estimated on the validity of the associated low-density boson picture. (Author)

AD-626 034 Fld. 20/3
CFSTI Prices: HC $1.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
MAGNETIC PROPERTIES OF MATERIALS IN THE SYSTEM CO SUB DELTA SI SUB DELTA M,
by David Wilcox. 15 Nov 65, 16p. Rept. no. TR-1311 9a

Unclassified report

Descriptors: (*Ferrites, Magnetic properties), (*Magnetic materials, Ferrites), Silicon compounds, Cobalt compounds, Ferromagnetic materials, Titanium compounds, Microstructure, X-ray diffraction analysis, Anisotropy

Attempts to substitute Co (+2) and Si (+4) in the Co sub delta Si sub delta M system in a manner analogous to the isomorphous Co (+2) and Ti (+4) substitutions in the system Co sub delta Ti sub delta M were unsuccessful. The Co (+2) and Si (+4) substitutions destroyed the original M-type ferrite and a W-type ferrite was formed. The appearance of materials with a cone of magnetocrystalline anisotropy and materials with a negative-anisotropy constant was attributed to the formation of a cobalt-substituted W-type hexagonal ferrite. Microphotographs and X-ray results indicated that most of the Si (+4) was present as impure tridymite (SiO2). Due to the difficulty of separating the mechanically bound SiO2 from the W-ferrite grains, it was not possible to determine whether any Si (+4) was present in the ferrite structure. (Author)

AD-626 046 Fld. 20/3, 9/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
FERRITE MATERIAL FOR CENTIMETER WAVELENGTHS,
by I. I. Silvestrovich, B. A. Pavelev, S. A.Nazarova-Shilkina, and V. M. Mkrtchyan. Dec 65, 4p. Rept. no. FSTC-381-T65-593
TT 66-60175

Unclassified report

Trans. of patent (USSR) 163 299, pub. in Byulleten Izobretenii i Tovarnykh Znakov (USSR) n12 1964.

Descriptors: (*Ferromagnetic materials, Superhigh frequency), Ferrites, Iron compounds, Oxides, Magnesium compounds, Chromium compounds, Manganese compounds, Carbonates, Vanadium compounds, Microwave equipment, USSR, Patents, Magnetic properties

The subject of the invention is a ferrite material for the centimeter-wave band on the basis of an Mg-Cr system. In order to decrease magnetic losses, it consists of (in mol .%): MgO 40 = 1.5; Fe2O3 40 = 1.5; Cr2O3 20 = 1.5. MnCO3 0.01 = 0.005 mol.%; V2O5 1.0 = 0.5% by weight is added when manufacturing large-sized parts from the material. (Author)

AD-626 114 Fld. 20/3
CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS
LONGITUDINAL NUCLEAR SPIN-SPIN COUPLING IN FERROMAGNETS AND ANTIFERROMAGNETS,
by D. Beeman, P. Pincus, and F. Hartmann-Boutron. 26 Apr 65, 3p.

Unclassified report

Prepared in cooperation with Paris Univ. (France).

Availability: Published in The Physical Review, v139 n6A pA1880-2 13 Sep 1965. Copies to DDC users only.

Descriptors: (*Nuclear spins, Ferromagnetism), (*Ferromagnetism, Nuclear spins), (*Antiferromagnetism, Nuclear spins), Nuclear magnetic resonance, Nuclear spectroscopy, Perturbation theory

The Suhl-Nakamura theory of indirect nuclear spin-spin coupling is extended to include the interaction between longitudinal components of nuclear spin in ferromagnets and antiferromagnets. The longitudinal coupling may give a significant contribution to the NMR linewidth of a dilute nuclear species in the presence of an abundant species, since the coupling between different nuclear species produced by the transverse Suhl-Nakamura interaction is nonsecular, whereas the coupling is secular for the longitudinal interaction. The second moment of the linewidth is found to have a T to the 5/2 power temperature dependence in the ferromagnetic case, and is relatively independent of temperature near T = 0 in the antiferromagnetic case. (Author)

AD-626 129 Fld. 20/3
CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS
FLUX PENETRATION IN CYLINDRICAL SUPERCONDUCTING FILMS. I. SPATIALLY CONSTANT ORDER PARAMETER.
Revised ed.,
by P. Pincus. 28 May 65, 3p.

Unclassified report

Revision of manuscript submitted 12 Feb 65.

Availability: Published in The Physical Review v140 n3A pA911-3 Nov 1 1965. Copies to DDC users only.

Descriptors: (*Superconductors, Films), (*Radio fields, Superconductors), Cylindrical bodies, Electric currents, Magnetic fields, Resonant frequency, Harmonic generators

The effective penetration depth p in thin cylindrical films (d<x (T),L (T) where x (T) and L (T) are, respectively, the temperature-dependent coherence length and zerofield penetration depth and d is the film thickness is calculated for rf fields while the film is in an axial static field H close to the tangential critical field c for a second-order phase transition. We find pu= L-sq (T)/d) (C-sq/(C-sq-H-sq)). In addition, we show that one may expect sizeable harmonic generation for static fields close to C-sq and for sufficiently thin films. (Author)

AD-626 215 Fld. 20/3, 12/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
FIVE-FIGURE TABLE OF THE FUNCTIONS 1/(1 TAN THETA) AND 1/(1 - COT THETA) FOR THE RANGE -90 DEGREES (1°) 90 DEGREES.
Interim rept.,
by W. K. Gardner, and E. B. Wright. 8 Dec 65, 52p. Rept. no. NRL-6362
Proj. RR-010-01-44-5601

Unclassified report

Descriptors: (*Trigonometry, Functions), (*Functions, Tables), (*Thermoelectricity, Seebeck effect), Thermocouples, Graphics

A table has been prepared of the functions 1/(1 - tan theta) and 1/(1 - cot theta) to five significant figures for the range -90 degrees (1°) 90 degrees. One alternative form of these functions is cos theta/(cos theta - sin theta) and sin theta/(sin theta - cos theta). A graph of the functions is included. (Author)

AD-626 329 Fld. 20/3, 20/12
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
HIGH FIELD MAGNETIC MOMENT AND ANTIFERROMAGNETIC RESONANCE MEASUREMENTS IN ALPHAFE203, COF2, FEF2 AND (MNF2)1-X (ZNF2)X,
by S. Foner. 1965, 7p. Contract AF49 (638)-1468 Proj. AF-9764 Task 976400
AFOSR 65-1981

Unclassified report

Availability: Published in Proceedings of the International Conference on Magnetism, Nottingham, 7-11 Sep 64. Copies to DDC users only.

Descriptors: (*Antiferromagnetism, Transformations), (*Magnetic moments, Antiferromagnetism), (*Magnetic resonance, Antiferromagnetism), (*Iron compounds, Magnetic properties), (*Fluorides, Magnetic properties), Magnetic fields, Oxides, Cobalt compounds, Manganese compounds, Zinc compounds, Solid solutions, Single crystals, Nuclear spins, Anisotropy

Pulsed field measurements of the spin-flop transition in natural single crystal alpha-Fe2O3 are presented for T = 4.2 to 250K and brief comments are made on related antiferromagnetic resonance experiments. The value of Hc = 65 = 3 kG for alpha-Fe2O3 for low temperatures leads to an anisotropy field which is about 1/50 of the dipolar anisotropy and is much smaller than previously estimated. Brief mention of related recent work by other investigators is included and it is suggested that high field reversal of memory in polycrystalline alpha-Fe2O3 reflects the spin-flop phenomenon. Free energy contributions of spontaneous moments to the critical field are discussed. Statisc magnetic susceptibility in CoF2 and FeF2 are presented as a function of temperature and compared to earlier torque data of Stout and Mataresse. Results of magnetic susceptibility, antiferromagnetic resonance and spin-flop in two compositions of (MnF2) 1-x (ZnF2)x are also briefly presented. Finally, the use of a.c. field modulation techniques with high d.c. magnetic fields for high resolution studies of magnetic transitions is indicated. (Author)

AD-626 389 Fld. 20/3, 9/1
CFSTI Prices: HC $3.00 MF $0.75
NATIONAL BUREAU OF STANDARDS WASHINGTON D C INST FOR APPLIED TECHNOLOGY
STUDIES OF SECOND BREAKDOWN IN JUNCTION DEVICES.
Final rept., 1 Sep 63-Aug 65,
by H. A. Schafft, and J. C. French. Dec 65, 81p. Contract AF30 (602)-3253 Proj. AF-5519 Task 551906
RADC TR-65-272

Unclassified report

Descriptors: (*Transistors, Failure (Electronics)), (*Failure (Electronics), Semiconductor devices), Reliability (Electronics), Crystal lattice defects, Electric currents, Voltage, Electric discharges

The report is divided into three sections. The first section is concerned with a study of second breakdown characteristics of transistors and how they are affected by the internal current distribution. The results of this study, which included the use of temperature-sensitive phosphors to reveal current distributions, have emphasized how intimately the susceptibility of the transistor to second breakdown is linked to the distribution of current or energy dissipation within the transistor. The second section concerns the study of the effect on second breakdown of crystallographic defects, detectable by means of x-ray diffraction microscopy. The susceptibility to second breakdown of about 1500 epitaxial planar silicon transistors diffused on two wafers was measured; the current construction of second breakdown was marked on most of these transistors. The third section presents an outline of the characteristics of second breakdown which is used to provide an understanding of the variety of approaches that the transistor industry has used to specify conditions of transistor operation free of second breakdown. These approaches are reviewed and discussed with the aim of maximizing their usefulness. (Author)

AD-626 542 Fld. 20/3, 20/1
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
SPIN-WAVE EXCITATION OF MAGNETOACOUSTIC MODES AND THE 'BEATING' OF THESE MODES IN YTTRIUM IRON GARNET,
by G. Thomas, and S. Wang. 9 Aug 65, 3p. Contract DA-ARO (D)-31-124-G557
AROD 4582:1

Unclassified report

Availability: Published in Applied Physics Letters v7 n7 p181-3 1 Oct 65. Copies to DDC users only.

Descriptors: (*Ferromagnetic materials, Oscillation), (*Mechanical waves, Magnetic fields), Acoustic properties, Phonons, Radio fields, Microwave frequency, Yttrium compounds, Iron compounds, Garnet

AD-626 615 Fld. 20/3
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
BIBLIOGRAPHY ON THERMOELECTRICITY,
by S. Goldman. Nov 58, 25p. Rept. no. TG-326 Contract NOrd-7386
TT 66-60265

Unclassified report

Descriptors: (*Thermoelectricity, Bibliographies), (*Bibliographies, Thermoelectricity), Semiconductors, Reports, USSR, Great Britain, France, Switzerland, Netherlands

AD-625 706 **See Fld. 20/8**

AD-625 757 **See Fld. 20/12**

AD-625 774 **See Fld. 20/12**

AD-625 797 **See Fld. 9/3**

AD-625 807 **See Fld. 20/9**

AD-625 897 **See Fld. 20/9**

AD-626 014 **See Fld. 7/4**

AD-626 043 **See Fld. 20/12**

AD-626 082 **See Fld. 20/12**

AD-626 227 **See Fld. 20/13**

AD-626 328 **See Fld. 9/1**

AD-626 353 **See Fld. 20/12**

AD-626 361 **See Fld. 20/12**

AD-626 365 **See Fld. 7/4**

AD-626 633 **See Fld. 20/7**

20/4. FLUID MECHANICS

AD-625 787 Fld. 20/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SIMILTUDE LAWS FOR A FLOW OF GAS IN A THIN HYPERSONIC NOZZLE,
by Yu. L. Zhilin. 26 Oct 65, 11p. Rept. no. FTD-TT-65-690
TT 66-60135

Unclassified report

Unedited rough draft trans. of Inzhenernyi Zhurnal (USSR) v3 n4 p628-31 1963. Supersedes trans. dated 2 Jul 65.

Descriptors: (*Nozzle gas flow, Hypersonic flow), (*Hypersonic flow, Mathematical models), Perturbation theory, Simulation, USSR, Boundary layer, Theory

A similitude law for flow of gas in a hypersonic nozzle taking into account the interactions of the boundary layer with a potential nucleus similar to a previously established similitude law for external flow past thin bodies is obtained. (Author)

AD-625 801 Fld. 20/4
CFSTI Prices: HC $4.00 MF $0.75
WESTERN CO OF NORTH AMERICA DALLAS TEX RESEARCH DIV
EFFECT OF MOLECULAR WEIGHT AND SEGMENTAL CONSTITUTION ON THE DRAG REDUCTION OF WATER SOLUBLE POLYMERS.
Final rept.,
by Gail T. Pruitt, and Horace R. Crawford. Apr 65, 125p. Contract Nonr-4306 (00) Proj. SR-009-01-01 Task SR-009-01-01-104
DTMB

Unclassified report

Descriptors: (*Drag, Reduction), (*Polymers, Molecular structure), (*Skin friction, Polymers), Molecular weight, Concentration (Chemistry), Reynolds number, Turbulence, Laminar flow, Pipes

Tube flow data on some 16 polymers indicate that drag reduction is a function of molecular contour length, segmental side groups, concentration, pipe diameter and Reynolds number. The maximum drag reduction actually obtained with any drag reducing polymer is approximately 80% of that which would be obtained if completely laminar flow was maintained. A relationship that correlates drag reduction, concentration and molecular dimensions is suggested for a constant Reynolds number and pipe size. It infers that a critical concentration of polymer exists, below which no drag reduction occurs. Also for some given concentrations and pipe size a critical velocity exists below which no drag reduction occurs. Rheological data for two polymer solutions are presented in terms of elastic energy. (Author)

AD-625 803 Fld. 20/4
CFSTI Prices: HC $5.00 MF $1.00
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
TURBULENT BOUNDARY LAYER OF A COMPRESSIBLE GAS,
by S. S. Kutateladze, and A. I. Leontev. 25 Oct 65, 183p. Rept. no. FTD-MT-64-164
TT 66-60147

Unclassified report

Edited machine trans. of mono. Turbulentnyi Pogranichnyi Sloi Szhimaemogo Gaza, Novosibirsk, 1962 180p.

Descriptors: (*Turbulent boundary layer, Compressible flow), (*Compressible flow, Turbulent boundary layer), Gas flow, Heat transfer, Friction, Reynolds number, Equations of motion, USSR

The theory of a turbulent boundary layer of a compressible gas is set forth or based on a study of the relative change of the coefficients of friction and heat transfer with growth of the M number, the heat transfer factor and the wall permeability factor b. The existence is shown of a limiting law, corresponding to very large Re numbers and almost full of self-simulation of relative changes of the coefficients of friction and heat transfer. Engineering methods are presented for solving the basic problems of friction and heat transfer in turbulent flow of a gas past a solid body. The theoretical conclusions are compared with experimental data. (Author)

AD-625 836 Fld. 20/4
CFSTI Prices: HC $5.00 MF $1.00
RAND CORP SANTA MONICA CALIF
BASIC CONCEPTS OF EQUATIONS FOR THE AERODYNAMICS OF BODIES OF REVOLUTION,
by Nikolai F. Krasnov. Aug 65, 169p. Rept. no. LT-65-15
TT 66-60154

Unclassified report

Trans. of mono. Aerodinamika Tel Vrashcheniya (Aerodynamics of Bodies of Revolution), Moscow, 1964 p7-105.

Descriptors: (*Bodies of revolution, Aerodynamics), (*Aerodynamic characteristics, Bodies of revolution), Equations, Gas flow, Shock waves, Boundary layer, Heat transfer, USSR

Aerodynamic forces and moments; the basic features of very high velocity gas flow; the basic concepts and equations for determining the flow parameters; Basic relations for determining gas parameters behind a shock wave; Results from boundary-layer and heattransfer theory.

AD-625 870 Fld. 20/4, 20/13
CFSTI Prices: HC $3.00 MF $0.75
ISTITUTO DI AERODINAMICA UNIV OF NAPLES (ITALY)
RESEARCH ON SUPERSONIC FLOW AROUND THREE DIMENSIONAL POINTED BODIES.
Final rept.,
by L. G. Napolitano. Dec 64, 76p. Rept. no. IA-121
Contract AF61 (052)-327
AFOSR 65-1710

Unclassified report

Descriptors: (*Supersonic flow, Reviews), (*Nonequilibrium flow, Reviews), Spikes, Thermodynamics, Three-dimensional flow, Mixtures, Italy, Equations

A review of research on non-equilibrium flows is presented. The work is divided into two parts, containing published and unpublished research, respectively. Part I deals with the thermodynamics and dynamics of multireacting mixtures. By starting from basic postulates, a self-consistent and complete thermodynamic theory is formulated. The study of the dynamics is mostly limited to the linearized approximation and falls within two categories: (a) formulation of basic equations and analysis of their overall properties; and (b) the solutions of typically representative flow fields. Part II deals with the derivation and discussion of the potential equation for linearized steady motion of a multireacting mixture within the volume-viscosity analogy. Also, the notion of thermodynamic characteristic speeds introduced in Part I is generalized, and a more exhaustive study of its properties is made. (Author)

AD-625 898 Fld. 20/4
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
THE CONE IN SUPERSONIC FLOW,
by Nikolai F. Krasnov. Aug 65, 82p. Rept. no. LT-65-15
TT 66-60168

Unclassified report

Trans. of mono. Aerodinamika Tel Vrashcheniya (Aerodynamics of Bodies of Revolution) Moscow, 1964 p106-54.

Descriptors: (*Conical bodies, Supersonic flow), (*Supersonic characteristics, Conical bodies), Axially symmetric flow, Heat transfer, Friction, Angle of attack, Numerical analysis, USSR

Symmetric flow around a pointed cone; Circular cones at angle of attack.

AD-625 974 Fld. 20/4
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
HYPERSONIC FLOW OVER AN OSCILLATING WEDGE,
by S. C. McIntosh,Jr.. 1964, 10p. Contract AF49 (638)-1274
AFOSR 65-1744

Unclassified report

Presented at AIAA Annual Structures and Materials Conference, (5th) Palm Springs, Calif. Apr 1-3 1964.

Availability: Published in AIAA Journal v3 n3 p433-40 Mar 1965. Copies to DDC users only.

Descriptors: (*Wedges, Hypersonic flow), (*Hypersonic flow, Wedges), Oscillation, Lift, Perturbation theory, Shock waves, Acoustic properties, Mathematical analysis

The equations of hypersonic small-disturbance theory are perturbed for small oscillations of a thin, semiinfinite, flexible wedge. A solution for arbitrary smooth mode shpaes is found in terms of infinite series. These series express the effects of acoustic waves, generated by the unsteady motion, that propagate in the flow field between the bow shock wave and the wedge surface. They reflect from the wedge surface and the shock wave, but they are attenuated only at the shock wave. Thus the degree of attenuation determines the influence of the waves. This attenuation decreases as the shock strength increases. It is then shown that the results from more approximate methods, such as piston theory and others that attempt to account for a strong bow shock, can be reproduced by successively neglecting terms in the 'complete' solution. It appears that the most significant contribution of the complete solution is to change the phase shift of the unsteady pressure. Finally, it is shown that the complete solution is the only one that will produce an adequate representation in the double limit of very large Mach number and adiabatic exponent near unity. (Author)

AD-625 994 Fld. 20/4
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
THE SURFACE AREA OF LIQUIDS IN CIRCULAR TUBES,
by Ted A. Erikson. 19 Jun 64, 8p. Contract AF49 (638)-1121
AFOSR 65-2259

Unclassified report

Availability: Published in the Journal of Physical Chemistry, v69 n6 p1809-13 Jun 1965. Copies to DDC users only.

Descriptors: (*Liquids, Surface area), Pipes, Tables, Numerical analysis

The surface area of a liquid in a circular tube approximates to about 2% the area represented by an oblate spheroid that has the tube radius and the meniscus height as its major and minor semiaxes, respectively. Over much of their range, the tables of Bashforth and Adams appear to represent coordinates of an ellipse within about 4%. (Author)

AD-626 021 Fld. 20/4
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
PHYSICAL ACOUSTICS,
by K. U. Ingard, L. W. Dean, G. C. Maling,Jr., M. A. Martinelli, and H. L. Willke,Jr.. 1965, 4p. Contract Nonr-1841 (42) ,DA-36-039-AMC-03200 (E)

Unclassified report

Availability: Published in Research Lab. of Electronics Quarterly Progress Report n79 p73-5 Oct 15 1965. Copies to DDC users only.

Descriptors: (*Laminar flow, Stability), Hydrodynamics, Magnetohydrodynamics, Perturbation theory

This report demonstrates the instability of the magnetohydrodynamic, as well as hydrodynamic, cases of lossless stationary parallel flow.

AD-626 023 Fld. 20/4
CALIFORNIA INST OF TECH PASADENA HYDRODYNAMICS LAB
SOME NEW MEASUREMENTS ON THE DRAG OF CAVITATING DISKS,
by G. J. Klose, and A. J. Acosta. 9 Nov 64, 6p. Rept. no. E-118.27
Contract N123 (60530)31686A

Unclassified report

Availability: Published in Journal of Ship Research p101-4 Sep 1965. Copies to DDC users only.

Descriptors: (*Disks, Drag), (*Cavitation, Drag), Water tunnels, Turbulence, Mathematical analysis

As part of an experiment on unsteady flow past a cavitating circular disk, it was necessary to make calibrating measurements of the drag on disks in steady flow. The measurements were made for greater cavitation numbers than have been previously recorded, and show that the drag coefficient is essentially linearly dependent upon cavitation number up to values of this parameter as high as 1.3. (Author)

AD-626 033 Fld. 20/4
CFSTI Prices: HC $3.00 MF $0.50
AEROSPACE CORP SAN BERNARDINO CALIF
SHOCK-SHOCK INTERACTION INSIDE THE MACH REFLECTION REGION FOR SLENDER SUPERSONIC BODIES,
by Victor D. Blankenship, and Adolf Busemann. Nov 65, 53p. Rept. no. TDR-669 (S6815-70)-1
Contract AF04 (695)-669
BSD TR-66-3

Unclassified report

Descriptors: (*Slender bodies, Supersonic characteristics), (*Shock waves, Supersonic flow), Wedges, Conical bodies, Transformations (Mathematics), Pressure

The transient pressure field produced behind a plane shock wave of arbitrary strength; which encounters (1) a thin supersonic wedge head-on, (2) a thin supersonic wedge yawed with respect to the plane shock wave, and (3) a slender supersonic cone head-on, is theoretically predicted where the intersection of the plane shock wave with the body bow shock occurs completely inside the Mach reflection region. Previous theoretical works have treated the cases where the intersection of the plane shock wave with the body bow shock occurs outside the Mach reflection region. The present analysis which utilizes a conical flow technique and conformal transformation treats small vertex angles (to ensure Mach reflection at the surface) and to inviscid flow. The small pressure perturbations that the thin wedges and slender cone create are determined. Ratios of the maximum transient pressure compared to the new steady state pressure on the surface of either cone or wedge are found to exceed unity. (Author)

AD-626 058 Fld. 20/4
CFSTI Prices: HC $5.00 MF $1.00
FLUID DYNAMICS RESEARCH LAB MASS INST OF TECH CAMBRIDGE
ANALYSIS OF TRANSONIC FLOW BY MEANS OF PARAMETRIC DIFFERENTIATION.
Final scientific rept., 1 Nov 64-30 Oct 65,
by Paul E. Rubbert. Nov 65, 179p. Rept. no. 65-2
Contract AF-AFOSR-156-65 Proj. AF-9781
Task 978101
AFOSR 65-1932

Unclassified report

Descriptors: (*Transonic flow, Mathematical analysis), (*Airfoils, Traaransonic flow), Partial differential equations, Stability, Lift, Pressure, Shock waves, Subsonic flow

A general method of solving nonlinear partial differential equations was developed and applied to the problem of inviscid transonic flow about airfoils. Soultions are given for nonlifting airfoils at all transonic Mach numbers, including those flows with detached shock waves, and extensions to include lifting and unsteady flows are discussed. Results are given for subsonic and supersonic flow, and for flows at Mach number unity which are in general agreement with other theoretical results

and with experiment. Inadequacies in the numerical technique prevented the accurate computation of shock movements, but prelimiliminary results indicate a rearward movement of the shock impinging on the airfoil surface with increasing airfoil thickness, and exhibit the commonly observed rapid acceleration behind the shock. The well known local linearization result of Spreiter and Alksne is shown to be an approximation to the present theory for subsonic flow.

AD-626 086 Fld. 20/4, 13/10
CFSTI Prices: HC $3.00 MF $0.75
DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB
THE INFLUENCE OF PRESSURE GRADIENT ON THE TURBULENT BOUNDARY LAYER OVER A ROUGH SURFACE.
Final rept.,
by Victor E. Scottron, and John L. Power. Dec 65, 63p. Rept. no. 2115
Proj. S-R0011-01-01, S-R013-11-08 Task 0401, 1356
Unclassified report

Descriptors: (*Turbulent boundary layer, Pressure), (*Ship hulls, Turbulent boundary layer), Roughness, Surface properties, Hydrodynamics, Sheat stresses, Velocity, Wind tunnels, Skin friction

The boundary layers produced on rough surfaces in adverse pressure gradients were investigated. The report contains experimental results obtained for a single surface roughness at three pressure conditions: one at constant pressure and two having adverse pressure gradients. The mean velocity profiles in the boundary layer were measured by both Pitot tubes and hot wires. The longitudinal turbulence intensities were measured with a hot wire. The pertinent boundary layer parameters were calculated and are presented. Results were compared with available smooth wall data. (Author)

AD-626 158 Fld. 20/4, 13/10
CFSTI Prices: HC $2.00 MF $0.50
TRG INC MELVILLE N Y
WAVE-WAKE INTERACTION.
Final rept.,
by Jerome R. Lurye, and Jack Kotik. Nov 65, 45p. Rept. no. TRG-036-FR
Contract Nonr-4682 (00) Proj. S-9-0090-01-01 Task 100
Unclassified report

Descriptors: (*Wake, Water waves), (*Ships, Water waves), Viscosity, Mathematical analysis, Drag, Fluid flow

The report is concerned with the complicating effects of the viscous wake on the problem of defining and determining the wave resistance of a ship in a real fluid. Discussions of a number of topics bearing on this problem are given. In the first of these, an idealized wake model is introduced to show how the wake can invalidate the usual ideal fluid wave-survey formulas for wave resistance. The second analyzes the problem of a plane surface wave incident upon a uniform stream of semi-infinite width from a region of stationary fluid, the latter being in contact with the stream along a vertical plane. Critical reflection angles are found, while the determination of the reflection and transmission coefficients is proved equivalent to the solution of a certain functional equation for the Fourier transforms of the velocity potentials. In the final discussion, examples are given of the modeling of a body plus its wake with ideal flows generated by simple distributions of singularities. (Author)

AD-626 160 Fld. 20/4
CFSTI Prices: HC $4.00 MF $0.75
VIDYA DIV ITEK CORP PALO ALTO CALIF
CALCULATION OF LAMINAR SEPARATION WITH FREE INTERACTION BY THE METHOD OF INTEGRAL RELATIONS. PART I. TWO-DIMENSIONAL SUPERSONIC ADIABATIC FLOW.
Rept. for Mar 64-May 65,
by Jack N. Nielsen, Larry L. Lynes, and Frederick K.Goodwin. Oct 65, 121p. Contract AF33 (615)-1591 Proj. AF-8219 Task 821902
FDFFDL TR-65-107
Unclassified report

Descriptors: (*Flow separation, Mathematical analysis), (*Supersonic flow, Flow separation), (*Adiabatic gas flow, Flow separation), Laminar flow, Two-dimensional flow, Programming (Computers), Pressure, Laminar boundary layer

Methods are presented for calculating the laminar boundary-layer flow through separation to reattachment under the influence of a prescribed pressure gradient or, in the case of a supersonic main stream, under the influence of 'free interaction' between the boundary layer and the main flow. The present method is based on the Dorodnitsyn method of integral relations and uses a rational velocccity profile which accounts properly for the separation singularity. As a result, the possibility of higher approximations is inherent in the method. The calculated solution for free interaction goes smoothly through the separation point and is in good agreement with certain features of the Navier-Stokes solution in the neighborhood of separation. Good agreement is exhibited betweeen experimental and calculated pressure distributions up to reattachment for the several cases for which the comparisons were made. A computer program based on the work was prepared for two-dimensional flow. It is planned to continue the work to cover nonadiabatic boundary layers and axisymmetric bodies. (Author)

AD-626 201 Fld. 20/4, 20/10, 20/13
CFSTI Prices: HC $3.00 MF $0.75
PURDUE UNIV LAFAYETTE IND SCHOOL OF AERONAUTICS ASTRONAUTICS AND ENGINEERING SCIENCES
PROBLEMS IN NONLINEAR VISCOELASTICITY.
Technical rept.,
by Severino L. Koh. Sep 65, 69p. Rept. no. TR-31
Contract Nonr-1100 (23) Proj. NR-064-410
Unclassified report

Descriptors: (*Viscoelasticity, Nonlinear systemsS), (*Fluid flow, Viscoelasticity), Propagation, Continuum mechanics, Thermodynamics, Equations of motion, Motion, Dynamics

Several nonlinear constitutive relations proposed by different investigators are briefly reviewed and an enumeration is given of the other fundamental equations needed in the analysis of specific problems. Among the problems discussed are steady flow of nonlinear viscoelastic fluids, periodic motion, wave propagation and thermomechanical coupled effects. (Author)

AD-626 298 Fld. 20/4
CFSTI Prices: HC $2.00 MF $0.50
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
THE INTERACTION OF TURBULENCE WITH RAPID UNIFORM SHEAR,
by H. K. Moffatt. Aug 65, 41p. Rept. no. SUDAER-242
Contract AF49 (638)-1274
AFOSR 65-1795
Unclassified report

Descriptors: (*Turbulence, Shèar stresses), Velocity, Perturbation theory, Fourier analysis, Fluid flow

The linear inviscid response of an initially weak random velocity perturbation to a uniform shearing motion is analysed, first in terms of the individual Fourier components of the perturbation field, then in terms of the development of its spectrum tensor. This analysis reveals that the dominant contribution, both to the disturbance energy and to the Reynolds stress generated, comes ultimately from eddies having a cylindrical structure, the axes of the cylinders being parallel to the shear force. The results are relevant to two aspects of turbulent shear flow: (1) the equilibrium structure of a small turbulent 'parcel' of fluid subjected to persistent almost uniform shear, and (2) the structure of the 'large eddies' which derive their energy directly from the shearing of the mean flow. Certain aspects of the distortion of turbulence by shear that is weakly non-uniform are also considered, and it is found that the gradient in the Reynolds stress generated tends to make the mean velocity profile propagate elastically as a shear wave, suggesting that in certain respects turbulent fluid behaves like a visco-elastic fluid in its response to shear. Finally, the relevance of these results to the phenomenon of the propagation of sharp turbulent-nonturbulent interfaces is discussed. (Author)

AD-626 301 Fld. 20/4, 16/4
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
THE EFFECT OF PROPULSIVE JET SPECIFIC HEAT RATIO ON BASE PRESSURE AT A FREESTREAM MACH NUMBER OF 2.18.
Technical memo.,
by H. Ginsberg. Aug 65, 28p. Rept. no. TG-718
Contract NOw-62-0604-c
Unclassified report

Descriptors: (*Base flow, Specific heat), (*Guided missiles, Aerodynamic characteristics), Pressure, Jets, Drag, Supersonic flow, Superaerodynamics

The report documents studies to determine experimentally the effect of thrusting-jet specific heat ratios on missile model base pressure. The tests were conducted at a freestream Mach number of 2.18 over a wide range of jet static to freestream static pressure ratios. Variation of the specific heat ratios was obtained by the use of different jet gases. Jet static pressure ratios up to 40 have been covered. Flow interference effects were held to a minimum by mounting the model on a support attached to a strut in the plenum chamber of the wind tunnel and reaching through the wind tunnel nozzle throat into the test section. The effects of molecular weight (at gamma = 1.66) on base pressure were briefly investigated. A molecular weight shift from 40 to 29 showed only a slight effect on base pressure, however, a shift from 29 to 4 increased the base pressure coefficient an average of 0.04 or approximately 20% of the minimum value. It was observed in this investigation that the base pressure reached its minimum value at a freestream-to-jet molecular weight ratio of unity for all jet static pressure ratios tested. Extension areas recommended for further investigation include the determination of jet-specific-heat ratio, jet temperature and molecular-weight effects on base pressure when freestream conditions and model afterbody geometry are systematically varied. (Author)

AD-626 347 Fld. 20/4
POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA
A STUDY ON THE STAGNATION REGION PAST AN AXISYMMETRIC BLUNT BODY IN A LOW REYNOLDS NUMBER HYPERSONIC FLOW.
Technical note,
by Aldo Muggia. 1964, 17p. Rept. no. Scientific-4 ,TN-28
Contract AF-EOAR-98-63
AFOSR 65-2186
Unclassified report

Availability: Published in Libreria Editrice Universitaria Levrotto and Bella, Torino, p1-12 1965. Copies to DDC users only.

Descriptors: (*Blunt bodies, Hypersonic characteristics), (*Stagnation point, Blunt bodies), Transport properties, Axially symme-

tric flow, Dissociation, Skin friction, Heat transfer, Reynolds number, Italy

A blunt axisymmetric body in a low density hypersonic flow is considered. The stagnation region is studied, taking into account both the transport phenomena (viscosity, thermal conductivity, diffusion) and the gas dissociation (in chemical nonequilibrium); a method is shown to determine the behaviour of the various quantitities, and the wall skin friction and heat transfer, for various wall temperatures and catalytic efficiencies. Some numerical results at Mach number 10 are reported, where the dissociation effects are neglected. (Author)

AD-626 349 Fld. 20/4
POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA
THE INTERNAL STRUCTURE OF THE SHOCK WAVE. I. HOMOGENEOUS GASES.
Technical note,
by Gianni Jarre. 1964, 26p. Rept. no. Scientific-5 ,TN-29
Contract AF-EOAR-98-63
AFOSR 65-2185
Unclassified report

Availability: Published in Libreria Editrice Universitaria Levrotto and Bella, Torino, p2-20 1965. Copies to DDC users only.

Descriptors: (*Shockwaves, Analysis), Thickness, Gases, Continuum mechanics, Entropy, Approximation (Mathematics), Italy, Energy

A critical review of the continuum theories on the structure of the shock wave leads to simplified estimates of the shock thickness, further improved after discussing the variability of the mean-free-path and the dynamics of the energy conversion. Possible residual discontinuities through the shock are briefly analyzed and discarded for common gases. The analysis of the entropic balance provides a simple general rule for estimating the thickness when many irreversible phenomena are involved through the shock wave. (Author)

AD-626 430 Fld. 20/4, 21/8
CFSTI Prices: HC $3.00 MF $0.50
BATTELLE MEMORIAL INST COLUMBUS OHIO
DETERMINATION OF ANALYTICAL TECHNIQUES AVAILABLE TO DETERMINE MATERIAL SUITABILITY FOR TURNING OF HOT GASES.
Technical rept.,
by Ira M. Grinberg. May 65, 56p. Contract N123 (60530)51201A
NAVWEPS 8746,NOTS ,NOTS TP-3814
Unclassified report

Descriptors: (*Gas flow, Exhaust nozzles), (*Ablation, Materials), Heat transfer, Thrust vector control systems, Rocket motor nozzles, Analysis, Refractory materials, Erosion, Ducts, Curved profiles, State-of-the-art reviews, Subsonic flow

The report presents the results of a state-of-theart survey of the analytical techniques available to predict material suitability for turning hot gases such as the exhaust from a rocket combustion chamber. The information on two-phase and single-phase subsonic flow is curved and straight sections was obtained from pertinent literature and conversations with technical workers in the field. Major emphasis was placed on flow mechanics of the exhaust, chemical effects between the exhaust and the walls of the duct, heat-transfer interactions between the exhaust and the duct walls, and performance of materials exposed to the exhaust environment. These factors were considered both in curved and straight channels. The analytic capabilities identified during the program are reviewed and summarized, and limitations in these capabilities are pointed out. Recommended areas in which future fundamental work would be most fruitful are also presented. A bibliography of pertinent literature and a listing of individuals contacted during the program are included. (Author)

AD-626 451 Fld. 20/4
CFSTI Prices: HC $5.00 MF $1.00
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
THE BEHAVIOUR OF FREE MOLECULE CYLINDRICAL LANGMUIR PROBES IN SUPERSONIC FLOWS, AND THEIR APPLICATION TO THE STUDY OF THE BLUNT BODY STAGNATION LAYER,
by A. A. Sonin. Aug 65, 155p. Rept. no. UTIAS-109
Contract AF19 (628)-363 ,Nonr-4073 (00)
Unclassified report

Descriptors: (*Langmuir probes, Suprsonic flow), (*Stagnation point, Langmuir probes), Blunt bodies, Plasma medium, Ionic current, Velocity, Charged particles, Reynolds number, Shock waves, Boundary layer, Canada

Experiments were performed in an RF generated, low density plasma flow to determine the behaviour of small, cylindrical Langmuir probes in high-speed flows. All mean free paths were large compared to the probe diameter except the mean free path for ion-ion collisions. The tests indicated that under simulated static conditions (probe axis parallel to flow velocity), the theory of Laframboise represented the ion current characteristic Debye length was large, but not when the probe radius was comparable to or smaller than the Debye length. The results indicated clearly that the ion current decreased with increasing normal velocity, reached a minimum, and then increased again for subsequent increases in velocity. Subsequently, the probes were used in a study of the charged particle number density and electron temperature distributions in the stagnation region of a flat-nosed cylinder in supersonic flow. The electron temperature had a constant value throughout the bow shock and the entire shock layer. The charged particle number density distribution measurements provided a graphic demonstration of the merging of the bow shock and the boundary layer at a value of Reynolds number of about 100, and also furnished evidence of the diffusive separation of the ions and atoms in the shock wave. Independent measurements of the ion flux to the stagnation point wall were in good agreement with the Langmuir probe measurements in the shock layer.

AD-626 475 Fld. 20/4, 13/10
CFSTI Prices: HC $3.00 MF $0.75
DAVIDSON LAB STEVENS INST OF TECH HOBOKEN N J
HYDROFOIL FLUTTER PHENOMENON AND AIRFOIL FLUTTER THEORY. VOLUME III. SWEEP AND TAPER.
Final rept.,
by Charles J. Henry, and M. Raihan Ali. Dec 65, 60p. Rept. no. R-1115
Contract NObs-88365 Proj. DL-2709/227
Unclassified report

See also AD-291 756.

Descriptors: (*Hydrofoils, Flutter), (*Airfoils, Flutter), Theory, Taper, Velocity, Hydrodynamics, Mathematical analysis, Aeroelasticity

Measured decay rates and flutter speeds for a twodegree-of-freedom hydrofoil model with sweep or taper do not agree with the decay rates and flutter speeds predicted by two-dimensional strip theory, whereas the measured and predicted frequencies are in agreement. Calculations based on the two-dimensional strip theory show that increasing sweep angle or decreasing taper yields higher flutter speeds as well as higher values of the critical density ratio. It is shown that flutter-speed predictions based on quasi-steady representations of the unsteady hydrodynamic forces are not valid. (Author)

AD-626 568 Fld. 20/4
CFSTI Prices: HC $3.00 MF $0.75
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
INTERFERENCE EFFECTS PRODUCED BY GASEOUS SIDE-JETS ISSUING INTO A SUPERSONIC STREAM,
by F. Maurer. 22 Nov 65, 89p. Rept. no. TG-230-T460
Contract NOw-62-0604-c
TT 66-60262
Unclassified report

Interferenzwirkungen Sietlich Austretender Gasformiger Steuerstrahlen bei Uberschallanstromung. Experimentelle und Analytische Untersuchungen bei Verwendung von Schlitzdusen Endlicher Lange. Trans. of Deutsche Versuchsanstalf fuer Luft- und Raumfahrt. Bericht (West Germany) n382 Jan 65.

Descriptors: (*Supersonic flow, Jet mixing flow), (*Control jets, Interference), West Germany, Fluid flow, Nozzles, Thrust vector control systems, Flat plate models, Model tests, Numerical analysis, Boundary layer, Injection, Control systems

Experimental and theoretical investigations are of a gaseous control jet from slot nozzles of finite length into a gaseous main stream at supersonic speeds. The experimental work is restricted to injection of cold air into a windtunnel flow over a flat plate at zero angle of attack. The experimental results consist of pressure distributions and normal force coefficients, as well as schlieren and oil-film photographs. On the basis of the observed results, a model is developed for analytical approximation. The calculated results, compared with the measured results, show the influence of the various parameters and give a better understanding of the flow processes. (Author)

AD-626 627 Fld. 20/4
CFSTI Prices: HC $1.00 MF $0.50
MASON LAB YALE UNIV NEW HAVEN CONN
FLOW INSIDE AN AXISYMMETRIC CAVITY INDUCED BY MOVING BOUNDARIES,
by Jean-Yves Parlange. Sep 65, 21p. Rept. no. 6
Contract Nonr-609 (47)
Unclassified report

Descriptors: (*Subsonic flow, Axially symmetric flow), (*Axially symmetric flow, Mathematical analysis), Motion, Boundary layer

The subsonic motion of a gas induced by moving walls inside an axisymmetric cavity is studied. The theory is then compared with experiments; and the agreement is found to be excellent. (Author)

D-625 762 See Fld. 13/9

AD-625 783 See Fld. 21/5

AD-625 784 See Fld. 21/5

AD-625 839 See Fld. 14/2

AD-625 887 See Fld. 4/1

AD-625 908 See Fld. 9/5

AD-625 965 See Fld. 12/1

AD-626 005 See Fld. 22/3

AD-626 006 See Fld. 6/16

AD-626 035 See Fld. 13/10

AD-626 303 See Fld. 4/1

AD-626 494 See Fld. 21/8

AD-626 606 See Fld. 4/1

20/5. MASERS AND LASERS

AD-625 796 Fld. 20/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
LASER,
by M. S. Soskin, V. L. Broude, and N. F. Prokopyuk. 27 Oct 65, 6p. Rept. no. FTD-TT-65-805 TT 66-60143

Unclassified report

Unedited rough draft trans. of Patent (USSR) 164 325, appl. no. 828515/26-25, 1 Mar 63.

Descriptors: (*Lasers, Optical equipment), Prisms (Optics), Mirrors, Patents, USSR

A laser which contains a sequential arrangement of a flat mirror, and a second mirror between which there is mounted a rotable prism. The purpose of the rotatable prism is to rearrange the frequency without readjusting the optical system between the active substance and the second mirror.

AD-625 894 Fld. 20/5
CFSTI Prices: HC $1.00 MF $0.50
HUGHES AIRCRAFT CO CULVER CITY CALIF AEROSPACE GROUP
DYNAMIC OPTICAL PROPERTIES OF LASER MATERIALS.
Semiannual technical summary rept.,
by J. W. Carson, and L. G. Komai. 30 Nov 65, 25p. Contract Nonr-4878 (00) ,ARPA Order-306

Unclassified report

Descriptors: (*Ruby, Optical properties), (*Lasers, Ruby), Temperature, Gain, Pumping (Optical), Interferometers

The results of temperature profile investigations in DL quality Linde ruby using non-resonant interferometric techniques are described. This constitutes the first part of an overall study of dynamic optical distortions in laser materials. Other investigations will include gain profile studies as well as polariscopic measurements of strainbirefringence. Preliminary gain studies are presented. (Author)

AD-626 031 Fld. 20/5
SYRACUSE UNIV N Y DEPT OF PHYSICS
RUBY AS A POTENTIAL MATERIAL FOR SUBMILLIMETER MASER.
Technical rept.,
by J. Hermance, and G. Wessel. 22 Dec 64, 2p. Rept. no. TR-2
Contract Nonr-669 (18) Proj. NR-014-407

Unclassified report

Availability: Published in Proceedings of the IEEE v53 n4 p400-1 Apr 1965. Copies to DDC users only.

Descriptors: (*Lasers, Submillimeter waves), (*Ruby, Lasers), Relaxation time, Cryogenics, Excitation, Atomic energy levels, Pumping (Optical)

AD-626 212 Fld. 20/5, 13/8, 17/8, 20/2
CFSTI Prices: HC $1.00 MF $0.50
LINDE DIV UNION CARBIDE CORP EAST CHICAGO IND
PRODUCTION ENGINEERING MEASURE FOR RUBE LASER RODS.
Quarterly progress rept. no. 1 1 Jul-30 Sep 65,
by B. H. Heise. 30 Sep 65, 16p. Contract DA-36-039-AMC-06168 (E)

Unclassified report

Descriptors: (*Lasers, Ruby), (*Ruby, Crystal growth), (*Crystal growth, Ruby), Manufacturing methods, Rods, Range finding, Crystals

The document reports progress toward improving the ruby growth process for the manufacture of Rangefinder laser rods. The work of the first quarter involved procurement of equipment, preliminary growth of crystals, improvement of growth apparatus, and initial runs investigating individual variables of the Verneuil growth process. Preliminary growth was performed: viz., shakedown for the two stations assigned to the project, and determination of the present status of crystal growth performed on two additional stations on temporary loan. The crystals produced in the latter investigation await evaluation. A means for accurately controlling the distance between the boule cap and the burner head was devised and installed and is now operating satisfactorily. A means for obtaining a continuous flow of powder was devised. This apparatus will be installed and tested on a growth station during the next quarter. Investigations of the effect of varying the diameter of the boule and the distance between the boule cap and the burner are well under way. Crystals produced in these investigations now await evaluation. All items on the critical path of the PERT diagram are on or ahead of schedule. Fabrication and active evaluation are temporarily behind schedule but these items do not lie on the critical path. (Author)

AD-626 314 Fld. 20/5, 7/5, 11/7
CFSTI Prices: HC $2.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y
ORGANIC LUMINESCENT MATERIALS FOR OPTICAL MASERS.
Final rept.,
by Gerald Oster. 13 Dec 65, 47p. Contract Nonr-839 (36) ,ARPA Order-306-36 Proj. NR-017-801

Unclassified report

Descriptors: (*Lasers, Materials), (*Luminescence, Materials), Hydrocarbons, Photochemistry, Plastics, Zinc compounds, Oxides, Photoconductivity, Dyes, Spiro compounds, Aromatic compounds, Phosphorescence, Anthracenes, Modulation, Interferometers

The luminescence properties of aromatic hydrocarbons in plastic matrices were examined. The relation between luminescence and photoconductivity of zinc oxide and its dependence on environmental factors was established. A fluorescein plastic having properties indicative of induced emission was made and tested. A new method for determining the degree of coherence of non-monochromatic light sources was devised. (Author)

AD-626 518 Fld. 20/5, 20/6
MICROWAVE LAB STANFORD UNIV CALIF
EFFECT OF GAUSSIAN BEAM SPREAD ON PHASE VELOCITY MATCHING IN CW OPTICAL SECONDHARMONIC GENERATION,
by G. E. Francois, and A. E. Siegman. 11 Feb 65, 9p. Rept. no. ML-1286
Contract AF-AFOSR-323-63
AFOSR 65-1957

Unclassified report

Availability: Published in The Physical Review v139 n1A pA4-9 5 Jul 1965. Copies to DDC users only.

Descriptors: (*Harmonic generators, Lasers), (*Lasers, Beams (Electromagnetic)), Crystals, Ammonium compounds, Hydrogen compounds, Phosphates, Crystal lattice defects, Harmonic analysis, Field theory

The results are reported of an experimental and theoretical study of the angular variation of optical second-harmonic generation in ammonium dihydrogen phosphate using a Gaussian single-transverse-mode cw gas-laser beam. The observed angular dependence of the second-harmonic output near the phase matching angle is significantly different from the (sin psi)-squared angular dependence predicted by plane-wave theory. The difference can be quantitatively explained by an extended analysis which takes into account the Gaussian amplitude distribution and spherical wavefront of the cw laser beam. The theory predicts small but sifnificant corrections to the results of measurements of the nonlinear coefficients of materials. These corrections can also account, at least approximately, for the effects of small crystal defects and imperfectly Gaussian beam patterns. (Author)

AD-625 760 See Fld. 4/2

AD-625 817 See Fld. 8/11

AD-625 923 See Fld. 7/4

AD-626 134 See Fld. 20/12

AD-626 517 See Fld. 7/5

20/6. OPTICS

AD-625 683 Fld. 20/6
CALIFORNIA UNIV SAN DIEGO
REFLECTING OPTICS FOR CALIBRATION OF SPECTRORADIOMETERS,
by R. W. Patch. 5 Dec 64, 4p. Contract AF-AFOSR-650-64
AFOSR 65-1808

Unclassified report

Availability: Published in Journal of the Optical Society of America v55 n4 p392-5 Apr 1965. Copies to DDC users only.

Descriptors: (*Radiometers, Calibration), Optics, Optiical instruments, Spectroscopy

The requirements are given for absolute calibration of a spectroradiometer by means of an extended standard source. In some cases the extended source may be used without auxiliary optics, but in many cases a concave mirror is necessary or desirable. For such a mirror, a relation between incident and reflected steradiancy is derived. Brandenberg's focusing relations for a concave spherical mirror are extended and applied to four practical cases, and it is shown that no loss in accuracy of calibration will result from the use of such mirrors provided that the source and the mirror are large enough. Experimental verification is given. (Author)

AD-625 743 Fld. 20/6
MITRE CORP BEDFORD MASS
DESIGN OF PLANE MIRROR SYSTEMS,
by David A. Berkowitz. 10 Jun 65, 5p. Rept. no. TM-04187
Contract AF19 (628)-2390 Proj. AF-508
ESD TR-65-123

Unclassified report

Availability: Published in Journal of the Optical Society of America v55 n11 p1464-7 Nov 1965. Copies to DDC users only.

Descriptors: (*Mirrors, Optical equipment components), (*Optical images, Rotation), Optics

It is shown that the rotation of an optical image by a system of plane mirrors relates directly to the angles between the successive planes into which the optical axis reflects. This permits simpler visualization of mirror systems and rapid design of such systems for particular image rotations. Tables of the rotation are presented in terms of angles easily measured and specified in the laboratory. (Author)

AD-625 772 Fld. 20/6, 20/2
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
KRAMERS-KRONIG DISPERSION ANALYSIS OF INFRARED REFLECTANCE BANDS,
by G. Andermann, A. Caron, and David A. Dows. 27 Mar 65, 9p. Contract AF-AFOSR-62-165
Proj. AF-9760 Task 976001
AFOSR 65-2398

Unclassified report

Availability: Published in Journal of the Optical Society of America v55 n10 p1210-6 Oct 1965. Copies to DDC users only.

Descriptors: (*Infrared spectroscopy, Analysis), (*Crystals, Infrared spectroscopy), Reflection, Band spectrum, Absorption, Refraction, Integration, Harmonic generatorors, Intensity

A procedure is presented for the use of the KramersKronig dispersion relations in treatment of normalincidence infrared reflection spectra to yield optical constants of crystals. The crux of the practical problem, treatment of unobserved wing regions in the integrations, is discussed in detail. Definitive methods of picking, optimum upper and lower limits for integration over actual data and for fitting artificial wings are discussed. The method is tested on a reflection spectrum generated by a model involving several damped harmonic oscillators. It is shown how a region involving a single band (but flanked by 'unobserved' bands) can be treated, and how accurately the method reproduces the theoretically known optical indices. It appears feasible to obtain the indices of absorption and of refraction to =0.005 and =0.002, respectively, given accurate data on reflectance. Integrated band intensities are reproduced to within a few percent. (Author)

AD-625 846 Fld. 20/6, 7/4
CFSTI Prices: HC $4.00 MF $0.75
ARMY MISSILE COMMAND REDSTONE ARSENAL ALA AERODYNAMICS BRANCH
A BIBLIOGRAPHY ON MICROWAVE (ROTATIONAL) SPECTROSCOPY,
by James E. Wollrab. 4 Aug 65, 106p.
AMC RD-TM-65-14

Unclassified report

Descriptors: (*Microwave spectroscopy, Bibliographies), Instrumentation, Line spectrum, Chemical bonds, Molecular structure, Quadrupole moments, Stereochemistry, Electronic properties, Magnetic properties

The references listed in the bibliography include a majority of the important papers and books that are related to the development of microwave spectroscopy. General references relating to the basic concepts of rotational and, in a limited way, vibrational spectroscopy are also included. The references have been placed under specific topic headings whenever possible. A chronological order under these headings is maintained. (Author)

AD-625 892 Fld. 20/6, 9/5
CFSTI Prices: HC $6.00 MF $1.25
SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS APPLIED RESEARCH LAB
STUDY OF TV-TYPE RADIOMETRIC SYSTEMS.
Final rept.
25 Nov 62, 243p. Rept. no. f-1017-2
Contract DA-19-020-ORD-5482

Unclassified report

Descriptors: (*Television cameras, Radiometers), (*Image orthicons, Radiometers), (*Radiometers, Image orthicons), Illumination, Intensity, Video signals, Oscilloscopes, Optics

A study was made of the video response of an image orthicon camera to point source illumination. Experimental results are presented on the response to a single point source that is fixed or changing in intensity of radiation. Experimental results are also presented on the resolution of two point sources and the video response of the two sources when one is changing in intensity or position. For adjacent point sources that differ greatly in intensity the response of the camera was nonlinear. The presence of the bright source sometimes completely obliterated the response of the dimmer. The experimental measurements included the effects of variation in point source radiation as well as that of background lighting and TV camera operating parameters. Theoretical results have been obtained on defocussing in the image section of the camera, diffusion of charge on the target, and the trajectory of electrons in the read-out beam current. Preliminary results indicate deflection of electrons by a large point charge on the target may partially cause both the spreading of response to high intensity signals as well as the disappearance of the weak point source adjacent to a strong one. (Author)

AD-625 914 Fld. 20/6
AMERICAN INST OF PHYSICS NEW YORK
CONFERENCE ON UNDERGRADUATE RESEARCH PROGRAMS IN OPTICAL PHYSICS HELD 8-12 JUNE 1964 AT SOUTHWESTERN COLLEGE, MEMPHIS, TENNESSEE,
by Van Zandt Williams, and J. H. Taylor. 1965, 9p.

Unclassified report

Availability: Published in Applied Optics v4 n5 p617-25 May 1965.

Descriptors: (*Optics, Research program administration), Universities, Physics, Scientific research, Symposia

AD-625 920 Fld. 20/6
POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST
A NEW THEORY OF WOOD'S ANOMALIES ON OPTICAL GRATINGS.
Scientific rept.,
by A. Hessel, and A. A. Oliner. 15 May 65, 26p.
Rept. no. PIBMRI-1264-65
Contract AF19 (628)-4324 Proj. AF-4600 Task 460004
AFCRL 65-459

Unclassified report

Availability: Published in Applied Optics v4 n10 p1275-97 Oct 1965. Copies to DDC users only.

Descriptors: (*Diffraction gratings, Refractive index), Resonance, Rayleigh scattering, Reflection, Theory, Graphics

A new theory of Wood's anomalies is presented which is based on a guided wave approach rather than the customary multiple scattering procedure. This approach provides both new insight and a method of calculation. It is shown that two distinct types of anomalies may exist: a Rayleigh wavelength type due to the emergence of a new spectal order at grazing angle, and a resonance type which is related to the guided complex waves supportable by the grating. A general theoretical treatment is presented which makes use of a surface reactance to take into account the standing waves in the grating grooves, and which derives the locations and detailed shapes of the anomalies. Rigorous results are obtained for a specific example; the amplitudes of all of the spectral orders are determined explicitly, and the Wood's anomaly effects are demonstrated clearly in graphical form for a variety of cases. (Author)

AD-625 975 Fld. 20/6, 9/5
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS
THE PARABOLOID MIRROR.
Physical science research papers,
by C. J. Sletten, and P. Blacksmith Jr.. 17 May 65, 22p. Rept. no. PSRP-162
Proj. AF-4600 Task 460004
AFCRL 65-814

Unclassified report

Availability: Published in Applied Optics v4 n10 p1239-51 Oct 1965. Copies to DDC users only.

Descriptors: (*Parabolic bodies, Optical properties), (*Mirrors, Parabolic bodies), Antennas, Theory, Reflectors, Focusing, Diffraction, Refraction, Wave transmission

Antenna designers have investigated paraboloidal reflectors intensively and are using focusing and diffraction characteristics of this mirror which are generally not used by optical workers. The authors summarize principal modes of employing paraboloids for transmitting and receiving radio waves and compare methods of design and analysis with optical usage. In particular, the focal region properties for small f-number relfectors are discussed including asymmetric sections which can be scanned advantageously by source motion. (Author)

AD-626 357 Fld. 20/6
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
INFRARED MATERIALS, FAR INFRARED REFLECTANCE SPECTRA AND DIELECTRIC DISPERSION OF A VARIETY OF MATERIALS HAVING THE PEROVSKITE AND RELATED STRUCTURES,
by C. H. Perry. 1964, 11p. Contract DA-36-039-AMC-03200 (E)

Unclassified report

Prepared in cooperation with Spectroscopy Lab., Mass. Inst. of Tech., Cambridge. Grant NSF-G-19637.

Availability: Published in Japanese Journal of Applied Physics v4 s1 p564-73 1965. Copies to DDC users only.

Descriptors: (*Infrared optical materials, Physical properties), (*Titanates, Infrared phenomena), (*Zirconates, Infrared phenomena), (*Fluorides, Infrared phenomena), Reflection, Spectra (Infrared), Dielectric properties, Crystal structure, Resonance, Ferroelectricity, Antiferromagnetism

Many compounds possessing the perovskite and related structures exhibit unusual properties, such as ferroelectricity and antiferromagnetism. Knowledge of the nature of the interatomic forces in the crystals prove extremely useful in explaining these phenomena. Of particular interest is the temperature-dependent low frequency mode which recent theories show is responsible for the ferroelectric and antiferroelectric behavior in certain perovskite titanates, zirconates and hafnates. The transmittance of a number of these materials were observed from 800-50/cm-1. Reflectance measurements at room temperature were made of a wider range in the far infrared. Two cubic perovskite fluorides are included. The data were analyzed using the Kramers-Kronig relationship to obtain the dielectric dispersion of these materials. The resonances observed are related to presumed normal modes of vibration of the crystals and comparison is made between the various materials. (Author)

AD-626 397 Fld. 20/6, 20/12, 7/4
PITTSBURGH UNIV PA DEPT OF PHYSICS
NUCLEAR-MAGNETIC-RESONANCE LINE NARROWING BY A ROTATING RF FIELD,
by Moses Lee, and Walter I. Goldburg. 1 Jun 65, 11p. Contract DA-ARO (D)-31-124-G284
AROD 2636:3

Unclassified report

Availability: Published in The Physical Review v140 n4A pA1261-71 Nov 15 1965. Copies to DDC users only.

Descriptors: (*Nuclear magnetic resonance, Line spectrum), Nuclear spins, Dipole moments, Attenuation, Electromagnetic fields, Radiofrequency, Rotation, Calcium compounds, Fluorides, Single crystals, Absorption spectrum

A nuclear-magnetic-resonance method is explored, which effectively attenuates the dipolar interaction in solids. The experimental technique corresponds to the observation of a free-induction decay in a frame of reference rotating with the fre-

quency of an applied rf field. When the amplitude H1 of this field is much greater than the local field in the solid, a4d when its frequency is appropriately chosen, the secular part of the dipolar interaction is removed. As a result the rotary saturation line is extremely narrowed. At smaller values of H1, nonsecular terms in the dipolar interaction come into play and contribute to line broadening. These nonsecular effects are investigated both theoretically and experimentally. All the measurements were made in single crystals of calcium fluoride. The calculation of the nonsecular contribution to the line width utilizes the unitary transformation method of Jordhal and Pryce. Theory and experiment are in good agreement. (Author)

AD-625 676 See Fld. 9/1

AD-625 855 See Fld. 14/2

AD-625 916 See Fld. 5/1

AD-625 929 See Fld. 17/5

AD-626 082 See Fld. 20/12

AD-626 146 See Fld. 17/8

AD-626 198 See Fld. 4/1

AD-626 228 See Fld. 4/1

AD-626 240 See Fld. 20/14

AD-626 268 See Fld. 4/1

AD-626 313 See Fld. 5/10

AD-626 361 See Fld. 20/12

AD-626 409 See Fld. 8/10

AD-626 495 See Fld. 20/2

AD-626 518 See Fld. 20/5

AD-626 632 See Fld. 4/1

20/7. PARTICLE ACCELERATORS

AD-626 633 Fld. 20/7, 20/3
CFSTI Prices: HC $1.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
ON A PROCEDURE FOR EVALUATING SPACE-CHARGE EFFECTS IN A BEAM BENDING MAGNET SYSTEM.
Preliminary rept. for May-Jun 64,
by S. V. Yadavalli. Jun 64, 17p. Contract Nonr-2728 (00) Proj. SRI-2692

Unclassified report

Descriptors: (*Magnets, Space charges), (*Space charges, Electron beams), (*Electron beams, Magnets), (*Particle trajectories, Space charges), Mathematical analysis, Potential theory

A procedure for evaluating the effect of space charge on the electron trajectories in the presence of a beam bending magnet system is outlined. The above procedure employs a particle trajectory equation derived from the principle of least action. A simplified trajectory equation applicable for a beam whose cross section is not far from circular is given. Also, it is mentioned that a beam whose cross section is elliptical can be treated in a similar manner employing results reproduced in an Appendix. It is obvious that an analogous procedure can be employed in the case of ion beams. (Author)

AD-625 958 See Fld. 9/5

AD-626 414 See Fld. 20/8

20/8. PARTICLE PHYSICS

AD-625 681 Fld. 20/8
CATHOLIC UNIV OF AMERICA WASHINGTON D C
ALPHA-PARTICLE CONTINUUM STATES,
by Paul Szydlik. 4 Jan 65, 10p. Contract AF-AFOSR-566-64
AFOSR 65-1821

Unclassified report

Prepared in cooperation with Naval Ordnance Lab., White Oak, Md.

Availability: Published in The Physical Review v138 n4B pB866-75 May 24 1965. Copies to DDC users only.

Descriptors: (*Alpha particles, Nuclear resonance), (*Nuclear scattering, Alpha particles), Nuclear energy levels, Excitation, Wave functions, Nuclear spins, Potential scattering, Tritons, Proton reactions, Neutron scattering

The two-channel collision matrix for the t+p to 3He+n system is obtained by calculating the amplitudes for isotopic spin 0 and 1 for the scattering of a nucleon and an A=3 nucleus and combining these amplitudes in the proper linear combinations. The isotopic-spin amplitudes are obtained by making a resonating-group approximation for the continuum wave functions. It is found that with an 'equivalent' central potential representing the nucleonnucleon force the theory predicts the existence of two isotopic spin-0 bound excited states. These states, a 0 (+) and a 1 (-), are related to two experimentally observed structures in the cross sections. The good agreement of the theoretical and experimental cross sections in an energy region above the experimental peaks is used to establish the semiquantitative correctness of the pure isotopic-spin amplitudes obtained. (Author)

AD-625 682 Fld. 20/8, 20/10
WAYMAN CROW LAB OF PHYSICS WASHINGTON UNIV ST LOUIS MO
NECESSARY CONDITION ON THE RADIAL DISTRIBUTION FUNCTION,
by Eugene Feenberg. 11 Sep 64, 4p. Contract AF-AFOSR-62-412 Proj. AF-9751 Task 975102
AFOSR 65-1810

Unclassified report

Availability: Published in Journal of Mathematical Physics v6 n4 p658-9 Apr 1965. Copies to DDC users only.

Descriptors: (*Distribution functions, N-body problem), (*N-body problem, Quantum mechanics), Helium, Fluids, Nuclear particles, Inequalities

Trial functions g (r) may be used as radial distribution functions to study the ground-state properties of a uniform extended quantum fluid. A result obtained by Wigner and Seitz in the study of the charged electron gas imposes an integral inequality on any assumed g (r). This inequality places an effective constraint on the location, magnitude, and width of the nearest-neighbor peak. (Author)

AD-625 697 Fld. 20/8
TORINO UNIV (ITALY) ISTITUTO DI FISICA
ON THE THEORY OF SCATTERING BY SINGULAR POTENTIALS,
by L. Bertocchi, S. Fubini, and G. Furlan. 30 Sep 64, 10p. Contract AF-EOAR-39-64 Proj. AF-9751 Task 975101
AFOSR 65-1848

Unclassified report

Availability: Published in Il Nuovo Cimento (Ser 10) v35 p633-43 16 Jan 1965. Copies to DDC users only.

Descriptors: (*Potential scattering, Phase shift), Wave functions, Series, S-matrix, Quantum mechanics, Field theory, Approximation (Mathematics)

Some characteristic features of the scattering by singular potentials are investigated both in the low- and the high-energy limit. (Author)

AD-625 700 Fld. 20/8, 20/10
TORINO UNIV (ITALY) ISTITUTO DI FISICA
RENORMALIZATION EFFECTS FOR PARTIALLY CONSERVED CURRENTS,
by S. Fubini, and G. Furlan. 23 Dec 64, 20p. Contract AF-EOAR-39-64
AFOSR 65-1851

Unclassified report

Availability: Published in Physics v1 n4 p229-47 1965. Copies to DDC users only.

Descriptors: (*Elementary particles, Field theory), (*Operators (Mathematics), Quantum mechanics), Strange particles, S-matrix, Hamiltonian

It is shown how to get, through the use of suitable commutation relations, sum rules for the renormalization ratios between bare and dressed coupling constants. The method is completely general and it can be applied to any broken symmetry. As an illustration the cases were considered of the weak vector current, both strangeness-conserving and strangeness-changing. (Author)

AD-625 706 Fld. 20/8, 20/3
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
ELECTROMAGNETIC MASS AND THE INERTIAL PROPERTIES OF NUCLEI,
by Chalmers W. Sherwin, and Robert D. Rawcliffe. 14 Mar 60, 21p. Rept. no. I-92
Contract DA-36-039-sc-56695 Task 3-99-01-002

Unclassified report

Descriptors: (*Nuclear properties, Inertia), (*Massenergy relation, Inertia), Electrostatic fields, Potential energy, Mass number, Field theory, Mass spectroscopy

According to the theory of relativity the inertial mass of any physical system should be a scalar quantity (no matter how distorted its electromagnetic structure) and the 'excess' inertial mass of electromagnetic origin should not be observable. Experimental evidence on both these points was examined for nuclei. Nuclei are particularly significant for this test because they are the only structures (excepting the elementary particles) which possess an appreciable fraction of their net mass in the form of electrostatic energy, they are the only structures which are formed as a result of the equilibrium between two very different types of known forces (electromagnetic, and nuclear), and their dimensions are large enough that there is reason to trust the validity of the electromagnetic laws. It is found that the inertial mass of a distorted nucleus, as measured by a mass spectrometer, has no observable asymmetry to an accuracy of 1 part in 100 of the asymmetry which is calculated to exist as a consequence of the electromagnetic energy. It is found that a comparison of nuclear mass differences (as measured by the mass spectrometer and by nuclear reactions) shows that the 'excess' electromagnetic inertial mass is not observable, to an accuracy of 1 part in 600. (Author)

AD-625 747 Fld. 20/8
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
TOTAL NEUTRON CROSS SECTIONS OF COPPER IRON, AND ALUMINUM NEAR 14 MEV,
by J. C. Albergotti, and J. M. Ferguson. 8 Nov 65, 13p. Rept. no. USNRDL-TR-929
Proj. SR-011-01-01 Task 0401

Unclassified report

Descriptors: (*Copper, Neutron cross sections), (*Iron, Neutron cross sections), (*Aluminum, Neutron cross sections), Magnesium, Measurement

Total neutron cross sections of Mg, Al, Fe, and Cu have been measured using T (d, n) neutrons in the energy range 12 to 14 MeV. The accuracy (counting statistics) is better than 1%. The energy resolution (two standard deviations of the energy resolution function) varies from 35 to 150 keV. Fluctuations of amplitude 2 to 3% and width of the order of 100 keV are found in the cross sections of Mg and Al. No such variations are found in the cross sections of Fe and Cu; a chi squared test agrees with a straight line fit to the Fe and Cu data. (Author)

AD-625 761 Fld. 20/8
CFSTI Prices: HC $3.00 MF $0.75
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF PHYSICS
A CALCULATION OF THE TIN ISOTOPES USING REALISTIC NUCLEON-NUCLEON INTERACTIONS.
Technical rept.,
by T. T. S. Kuo, Elizabeth Baranger, and Michel Baranger. Nov 65, 59p. Rept. no. TR-21
Contract Nonr-760 (15) Proj. NR-024-439
Unclassified report

Descriptors: (*Tin, Isotopes), (*Isotopes, Nuclear shell models), Nuclear reactions, Nucleons, Potential theory, Nuclear energy levels, Matrix algebra, Wave functions, Excitation, Nuclear scattering, Odd-even nuclei

Shell-model matrix elements are calculated for Tabakin's two-nucleon interaction, which is a sum of separable potentials fitted to the nucleon-nucleon scattering data up to 320 MeV and designed to be used in Hartree-Fock calculations. It is shown that p-states make a substantial contribution to the pairing matrix elements, in some cases larger than the contribution of s-states. The matrix elements are compared with those calculated by T. T. S. Kuo and G. E. Brown using the Hamada-Johnston potential, and there is remarkable numerical agreement. A quasiparticle calculation is made with these matrix elements to study the low-lying states of the tin isotopes. The results are that, when only the usual five single-particle states are included, the odd-even mass difference is roughly half the experimental value; when more configuration mixing is included by allowing excitation of the core and permitting higher levels to be partially filled, satisfactory agreement is attained with the experimental oddeven mass difference, with the low-energy spectra of the odd isotopes, and with changes in separation energies. (Author)

AD-625 767 Fld. 20/8
FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)
THE MESON MULTIPLICITY IN NUCLEON-NUCLEON COLLISIONS AT 3000 GEV,
by C. B. A. McCusker, and L. S. Peak. 19 Jun 63, 16p. Contract AF-AFOSR-62-410
AFOSR 65-1809
Unclassified report

Availability: Published in Il Nuovo Cimento Series 10 v31 p525-40 Feb 10 1964. Copies to DDC users only.

Descriptors: (*Mesons, Nuclear scattering), Cosmic rays, Protons, Energy, Charged particles, Nuclear models, Ionization trails

The mean multiplicity of charged particles in nucleonnucleon collisions at 2,800 GeV has been determined by two different methods. The two methods give results in good agreement with each other and with Wilson cloud chamber results. The weighted mean from this experiment is n = 10.8=0.8. The mean energy has been found by two different methods, the second of which involves a determination of the cosmic-ray proton energy spectrum from 10 to the 10th power to 10 to the 16 power eV. The change in the average multiplicity in nucleon-nucleon collisions from 16 GeV to 2,800 GeV can be well approximated by a law n = 4.1 log E/log 16 where E is the incident proton energy in GeV. (Author)

AD-625 921 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
DOUBLE-CHARGE-EXCHANGE SCATTERING OF PIONS FROM NUCLEI,
by R. G. Parsons, J. S. Trefil, and S. D. Drell. 8 Jan 65, 4p. Contract AF49 (638)-1389
AFOSR 65-1834
Unclassified report

Availability: Published in The Physical Review v138 n4B pB847-50 May 24 1965. Copies to DDC users only.

Descriptors: (*Meson scattering, Pions), (*Differential cross section, Meson scattering), Nuclear structure, Nuclear shell models, Momentum, Wave functions, Helium, Nuclei, Neutron scattering

Pions offer a unique possibility as probes of nuclear structure since they can exchange two units of electrical charge unaccompanied by other quantum numbers. We have calculated the double-charge-exchange cross section for the reaction pion (-)+He3 to pion (+)+3n in the impulse approximation using the Chew-Low model for the pionnucleon interaction. Only the dominant 3-3 channel is retained. For incident pions in the energy region of several hundred MeV, values of the differential cross section are obtained for forward angles. Triple-scattering terms are also calculated and found to introduce corrections of <10% in the differential cross section. Similar results are obtained when the work is extended to the reaction pion (+)+O18 to pion (-)+Ne18 using shell-model wave functions. (Author)

AD-625 925 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
ELASTIC MAGNETIC ELECTRON SCATTERING,
by R. H. Pratt, and J. D. Walecka. 6 Jul 64, 8p.
Contract AF49 (638)-1389
AFOSR 65-1833
Unclassified report

Availability: Published in Nuclear Physics v64 p677-84 1965. Copies to DDC users only.

Descriptors: (*Elastic scattering, Electrons), (*Nuclear magnetic moments, Elastic scattering), Differential cross section, Nuclear scattering, Approximation (Mathematics)

180 deg elastic scattering of electrons from nuclei, as in the recent experiments of Goldemberg and Torizuka, is discussed in Born approximation, and the corrections expected to arise from a static magnetic moment are indicated. (Author)

AD-625 927 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
MESON DECAYS AS POSSIBLE TESTS FOR A STRONG C VIOLATION.
by Y. Fujii, and G. Marx. 17 May 65, 3p. Contract AF49 (638)-1389
AFOSR 65-1839
Unclassified report

Availability: Published in Physical Letters v17 n1 p75-7 Jun 15 1965. Copies to DDC users only.

Descriptors: (*Mesons, Decay schemes), K mesons, Pions, Meson reactions, Gamma emission, Matrix algebra

Transition matrix elements are investigated which conserve P, violate C, and either conserve the isospin I or connect the I violation with the emission of real photons, and do not contain many particles and high derivatives.

AD-625 932 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
MULTICHANNEL EFFECTIVE-RANGE THEORY FROM THE N/D FORMALISM,
by Pran Nath, and G. L. Shaw. 28 Dec 64, 5p.
Contract AF49 (638)-1389
AFOSR 65-1837
Unclassified report

Prepared in cooperation with California Univ., Riverside. Dept. of Physics.

Availability: Published in The Physical Review v138 n3B pB701-6 May 10 1965. Copies to DDC users only.

Descriptors: (*Nuclear scattering, Potential theory), Matrix algebra, Quantum mechanics, Series, S-matrix, Approximation (Mathematics), Nuclear reactions

An effective-range theory for systems of many coupled two-body channels is given using the N/D formalism. The effective-range expansion is carried out in the amplitudes M sub ij (where M is essentially the matrix I/T with the right-hand cut removed). Quite in analogy with the single-channel effective-range theory, the diagonal elements M sub ii are given by an expression quadratic in the relative momentum in channel i. The effective ranges R sub ii are given by certain principalvalue integrals which depend on the position of the lefthand singularities in the corresponding channels and can be taken to be energy-independent to the same extent as in the one-channel theory. The nondiagonal elements M sub ij in general, have a weak energy dependence and can approximately be treated as constants. A two-channel computer experiment is performed to test these proposals in detail. Three different situations for the left-hand cut are considered: (i) a set of monopoles, (ii) a set of dipoles, and (iii) the left-hand cut produced by the exchange of scalar particles in the 'crossed' t reactions. For a large number of situations considered, the simple features proposed for the multichannel effective range theory were found to exist. (Author)

AD-625 936 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
SINGLE-CHANNEL CALCULATION OF THE RHO RESONANCE WITH INELASTIC UNITARITY,
by Philip W. Coulter, and Gordon L. Shaw. 19 Jan 65, 6p. Contract AF49 (638)-1389
AFOSR 65-1836
Unclassified report

Availability: Published in The Physical Review, v138 n5B pB1273-8 7 Jun 1965. Copies to DDC users only.

Descriptors: (*Resonance scattering, Mesons), (*Inelastic scattering, Resonance scattering), Nuclear resonance, Potential theory, Meson scattering, Pions, K mesons, Series

The width and shape of the rho resonance are computed from a single-channel N/D formalism with inelastic unitarity. The input force is assumed to be furnished primarily by the exchange of the rho in the crossed channels. The input mass (760 MeV) and width (100 MeV) are taken from experiment. The inelastic factor eta is assumed to be determined by the pion-pion to pion-omega reaction at low energy and fitted to various arbitrary forms at higher energies. A cutoff is adjusted to produce the rho resonance at the observed energy. The smallest output width obtained is 250 MeV, as compared with 600 MeV for the pure-elastic-scattering (eta = 1) calculation. A more nearly symmetric shape for the resonance is obtained when inelastic effects are considered. (Author)

AD-625 937 Fld. 20/8, 7/4
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
STRUCTURE OF THE PROTON AND THE HYPERFINE SHIFT IN HYDROGEN,
by C. K. Iddings. 26 Oct 64, 13p. Contract AF49 (638)-1389
AFOSR 65-1775

Unclassified report

Availability: Published in The Physical Review, v138 n2B pB446-58 26 Apr 1965. Copies to DDC users only.

Descriptors: (*Hyperfine structure, Hydrogen), (*Protons, Hyperfine structure), Nuclear structure, Ground state, Integrals, Proton scattering, Electrons, Field theory

The proton-size correction to the hyperfine structure in the ground state of atomic hydrogen is reexamined. It is shown by means of dispersion relations that this correction can be expressed as an integral over experimentally measurable cross sections for electron-proton scattering. This clarifies the physical nature of the correction, puts it on a rigorous basis and lends support to previous analyses. In the absence of experimental data, some theoretical estimates are given for the correction. They agree with previous estimates, and therefore the present experimental value for the hyperfine splitting cannot be explained. Possible implications of this disagreement are discussed and some experiments are suggested which would clarify the situation. (Author)

AD-625 939 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
STRUCTURE OF HE3 AND H3 FROM HIGH-ENERGY ELECTRON SCATTERING,
by R. J. Oakess, and T. A. Griffy. 1965, 4p. Contract AF49 (638)-1389 Grant ,NSF-GP-948
AFOSR 65-1835

Unclassified report

Prepared in cooperation with High Energy Physics Lab., Stanford Univ., Calif. and Stanford Univ., Calif. Dept. of Physics.

Availability: Published in Reviews of Modern Physics, v37 n3 p402-5 Jul 1965. Copies to DDC users only.

Descriptors: (*Nuclear structure, Nuclear isobars), (*Inelastic scattering, Electrons), Helium, Hydrogen, Tritons, Wave functions, Nuclear reactions, Nuclear magnetic moments, Deuterons

The cross section was computed for the knockout of a proton by an inelastically scattered electron in He3 and H3 in two approximations: (i) the nonrelativistic approximation in which the three-body nucleus is described by a wave function, and (ii) the nucleon-pole approximation. In the former case the Irving-Gunn wave function was found to best predict the shape of the cross section. In the latter case the shape is given by the nucleon propagator and agrees quite well with the data. In both approximations essentially one parameter enters, I (0) in the former and gamma in the latter. Their relation is given.

AD-625 940 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
VALIDITY OF THE PHASE-SHIFT REPRESENTATIONS,
by Y. Fujii. 1 Mar 65, 4p. Contract AF49 (638)-1389
AFOSR 65-1838

Unclassified report

Availability: Published in The Physical Review v139 n2B pB472-B475 26 Jul 1965. Copies to DDC users only.

Descriptors: (*Elastic scattering, Potential theory), (*Phase shift, Elastic scattering), S-matrix, Nuclear resonance, Conformal mapping, Nuclear models

Our previous discussion on the validity of the phaseshift representation is further developed. An example treated in a previous work based on a separable-potential model is given in an improved method to show that such a representation fails in more general cases than those considered recently by Bander, Coulter, and Shaw, based on a simplified N/D model. It is also shown that d, the imaginary part of the elastic phase shift, is a boundary value of a function which connects the elastic S-matrix element in the physical sheet to that in other Riemann sheets. Consequently, d should be so chosen as to satisfy certain mathematical conditions as well as to fit experiments. The simplest example of such a function is given. (Author)

AD-625 989 Fld. 20/8, 20/10
LYMAN LAB OF PHYSICS HARVARD UNIV CAMBRIDGE MASS
TROUBLE WITH RELATIVISTIC SU (6).
Revised ed.,
by Sidney Coleman. 5 Feb 65, 8p. Contract AF49 (638)-1380 Proj. AF-9751 Task 975101
AFOSR 65-1830

Unclassified report

Revision of manuscript submitted 18 Jan 65.

Availability: Published in The Physical Review v138 n5B pB1262-7 Jun 7 1965. Copies to DDC users only.

Descriptors: (*Groups (Mathematics), Relativity theory), (*Nuclear reactions, Elementary particles), Algebra, Quantum mechanics, Operators (Mathematics), Invariance, Momentum, Nuclear energy levels

A relativistic generalization has been proposed of the SU (6) group, based on the product of U (6) and U (6). The smallest group containing this group and the Poincare group is found. This group has the catastrophic feature that all of its faithful unitary representations contain an infinite number of states for fixed four-momentum; thus there are an infinite number of particles in every supermultiplet. It is conjectured that similar difficulties afflict every group that contains an internal symmetry group and the Poincare group in such a way that these groups do not commute. The conjecture is proved for a large class of Lie groups (semidirect products of semisimple groups and Abelian groups), under the restrictive assumption that the translations are contained in the Abelian group. (Author)

AD-626 056 Fld. 20/8
CFSTI Prices: HC $2.00 MF $0.50
OSLO UNIV (NORWAY) INST OF PHYSICS
HIGH ENERGY PHYSICS WITH EMPHASIS ON STRANGE PARTICLES.
Final scientific rept.,
by O. Skjeggestad, and S. O. Sorensen. 31 Aug 65, 38p. Contract AF-EOAR-100-63 Proj. AF-9751 Task 975101
AFOSR 65-1912

Unclassified report

Descriptors: (*Strange particles, Decay schemes), Hyperons, Meson capture, Pions, K mesons, Meson reactions, Radioactive decay, Deuteron reactions, Tritons, Helium, Nuclei, Programming (Computers)

Summaries are given of these published reports: Phase space; Search for an excited state of the (lambda) Be 9 Hypernucleus; Fortran program for the analysis of hyperfragments from their production or decay; Hypernuclei from ξ (-) captures in nuclear emulsions; Energy spectrum of charged pions from K (-) captures in CF3Br. to R-DD1473.

AD-626 095 Fld. 20/8
OSLO UNIV (NORWAY) INST OF PHYSICS
A SYSTEMATIC STUDY OF HYPERNUCLEI FROM ξ CAPTURES IN NUCLEAR EMULSIONS,
by A. G. Frodesen, T. Roe, and O. Skjeggestad. 28 Dec 64, 10p. Contract AF-EOAR-100-63

AFOSR 65-1841

Unclassified report

Availability: Published in Nuclear Physics, v68 n3 p575-81 1965. Copies to DDC users only.

Descriptors: (*Nuclear reactions, Sigma hyperons), (*Sigma hyperons, Nuclear reactions), Decay schemes, Nuclei, Hyperons, K mesons, Pions

A total of 35 hypernuclei produced by stopping sigma (-) hyperons in nuclear emulsions has been studied with main emphasis on the identification problem. A kinematical analysis of the hypernucleus production and decay stars has been combined with mass and charge determination of individual prongs. Out of 25 non-mesic hypernuclei, 8 could be uniquely identified and 4 assigned a unique charge. All 10 mesic decays could be uniquely identified. The emission rate of measureable hypernuclei from sigma (-) capture is found to be (3.7=0.9)0/0. For hypernuclei of charge Z>or =2 the overall non-mesic to mesic decay ratio is 4.2=1.9. (Author)

AD-626 104 Fld. 20/8
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
AN ANTISYMMETRIC FORMULATION OF THE OPTICAL MODEL POTENTIAL AND THE EFFECT OF THE NUCLEAR FORCE RANGE,
by F. J. Bloore. 21 Sep 64, 15p. Contract AF-EOAR-79-63
AFOSR 65-1865

Unclassified report

Availability: Published in Nuclear Physics, v66 p217-29 1965. Copies to DDC users only.

Descriptors: (*Nuclear forces, Potential theory), (*Potential theory, Nuclear models), Elastic scattering, Nucleons, Nuclear structure, Wave functions, Approximation (Mathematics)

It is at first sight plausible that the comparatively large range of the nucleon-nucleon force may considerably reduce the central strength of the real part U of the optical potential in light nuclei below the value which obtains inside heavy nuclei. This effect is strongly exhibited in the prescription for U which arises from a formulation of the scattering problem which treats the incident particle as distinguishable. However, this prescription overestimates U by a factor 5. An antisymmetric formulation is presented which suggests a new non-local form for the potential U. In this formulation the factor 5 is removed. This non-local potential is discussed for infinite nuclear matter and for a finite nucleus. A local potential 'equivalent' to the non-local potential for the finite nucleus is introduced by means of the Born approximation but the results are inconclusive. (Author)

AD-626 108 Fld. 20/8, 20/10
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
HIGH-ENERGY BEHAVIOUR OF PRODUCTION AMPLITUDES IN PERTURBATION THEORY,
by J. C. Polkinghorne. 14 Sep 64, 11p. Contract AF-EOAR-36-65
AFOSR 65-1846

Unclassified report

Availability: Published in Nuovo Cimento, v36 n10 p857-65 1 Apr 65. Copies to DDC users only.

Descriptors: (*Perturbation theory, Integral transforms), Nuclear reactions, Quantum mechanics, Integrals

A unified method for extracting the high energy behaviour of production amplitudes in perturbation theory is developed with the aid of Mellin transforms. A wide range of limits is evaluated including that possible in the physical region. (Author)

AD-626 217 Fld. 20/8
CFSTI Prices: HC $3.00 MF $0.50
HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF
ELASTIC ELECTRON SCATTERING FROM THE MAGNETIC MULTIPOLE DISTRIBUTIONS OF LI6, LI7, BE9, B10, B11 AND N14,
by R. E. Rand, R. Frosch, and M. R. Yearian.
Nov 65, 55p. Rept. no. HEPL-402
Contract Nonr-225 (67)

Unclassified report

To be submitted to Physical Review.

Descriptors: (*Electrons, Nuclear scattering), (*Nuclear scattering, Electrons), (*Nuclear shell models, Scattering), Lithium, Beryllium, Boron, Nitrogen, Magnetic moments, Dipole moments, Harmonic generators, Nuclear spins, Nuclear energy levels

The magnetic form factors of the 1 p-shell nuclei Li6, Li7, Be9, B10, B11, N14, were measured by high energy electron scattering at an angle of 180 degrees. Incident electron energies up to 230 MeV were used. Results are interpreted in terms of harmonic oscillator and finite square well shell models. Parameters dependent only on the coupling of the angular momenta in the 1 p-shell may be obtained from the data. They show a general trend from L-S coupling to j-j coupling as the mass number increases, in agreement with calculations of magnetic dipole moments and energy level schemes. The outstanding exception is Li7 whose form factor is accurately described by the extreme independent particle model. (L-S coupling is quite incompatible with the data.) The Li6 results may also be interpreted in terms of an 'alpha plus deuteron' model. Numerical results for the harmonic well strengths are obtained and compare favorably with electron charge scattering values. (Author)

AD-626 299 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
NONEQUIVALENCE OF THE ONE-CHANNEL N/D EQUATIONS WITH INELASTIC UNITARITY AND THE MULTICHANNEL 1/ND EQUATIONS.
by Myron Bander, Philip W. Coulter, and Gordon L. Shaw. 28 Dec 64, 5p. Contract AF49 (638)-1389 Proj. AF-9751 Task 975101
AFOSR 65-1755

Unclassified report

Availability: Published in Physical Review Letters v14 n8 p270-2 Feb 22 1965. Copies to DDC users only.

Descriptors: (*Elastic scattering. Potential Theory), Nuclear forces, Integral equations, Phase shift, S-matrix

An example is presented demonstrating the nonequivalence of the one-channel N/D equations with inelastic unitarity and the multichannel 1/ND equations. A partial-wave elastic-scattering amplitude A = N/D determined by the Frye-Warnock equations is shown in general not equal to the amplitude determined by the multichannel 1/ND formalism for a set of coupled twobody channels with potentials B. It is found that a sufficient condition for the two calculations to agree is that the diagonal forces in the channels not explicitly considered should not be strong enough to produce bound states in the absence of coupling to channel 1. It is speculated that this condition holds in general. (Author)

AD-626 330 Fld. 20/8, 20/10
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
RELATIVISTIC EFFECTS IN THE FORM FACTORS OF HE3 AND H3,
by Geoffrey B. West. 7 Apr 65, 9p. Contract AF49 (638)-1389
AFOSR 65-1971

Unclassified report

Availability: Published in The Physical Review v139 n5B pB1246-B1252 6 Sep 1965. Copies to DDC users only.

Descriptors: (*Nuclear structure, Relativity theory), (*Relativity theory, Nuclear isobars), Tritons, Helium, Nuclear properties, Nucleons, Wave functions, Elastic scattering

Relativistic corrections to Schiff's nonrelativistic analysis of the three-body nuclei form factors are estimated. High-energy electron scattering from these nuclei is re-examined using an impulse approximation in which the intermediate nucleon states are taken to propagate and interact as free particles. We conclude that the corrections to the form factors are small (<5%) for -- 9 sq <8/F sq. However, it is shown that they assume great importance if the experiments are used to investigate the neutron charge form factor. Various effects arising from the use of the impulse approximation are discussed. These include considerations of current conservation, of the static limit (q sq approaches 0), and of the extraction of nuclear form factors from the impulse-approximation nuclear current. (Author)

AD-626 331 Fld. 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
MUON CAPTURE AND INELASTIC ELECTRON SCATTERING IN C12 AND O16,
by Taber deForest,Jr.. 19 Apr 65, 12p. Contract AF49 (638)-1389
AFOSR 65-1972

Unclassified report

Availability: Published in The Physical Review v139 n5B pB1217-B1226 Sep 1965. Copies to DDC users only.

Descriptors: (*Meson capture, Muons), (*Inelastic scattering, Electrons), Carbon, Oxygen, Wave functions, Matrix algebra, Nuclear structure

The dipole (first-forbidden) contribution to the muoncapture matrix elements is calculated using wave functions computed in the particle-hole theory. The assumption that the dipole part of the nuclear matrix element may be expressed as the unretarded dipole matrix element multiplied by the elastic form factor is found to hold to about 1%. Calculations of inelastic electron scattering from the 2 (-), T = 1 states in these nuclei predict large cross sections for some of the states at about 100 MeV/c momentum transfer. These 'giantmagnetic-quadrupole states' are identified with observed levels found in recent 180 deg electron-scattering experiments. (Author)

AD-626 332 Fld. 20/8, 20/10
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
P- AND D-STATE CONTRIBUTIONS TO THE MAGNETIC MOMENT FORM FACTORS OF H3 AND HE3,
by B. F. Gibson. 22 Apr 65, 9p. Contract AF49 (638)-1389
AFOSR 65-1973

Unclassified report

Availability: Published in The Physical Review v139 n5B pB1153-9 6 Sep 1965. Copies to DDC users only.

Descriptors: (*Nuclear magnetic moments, Nuclear structure), Nuclear isobars, Helium, Tritons, Quantum mechanics, Wave functions, Nuclear spins, Groundstate

The effects of reasonable admixtures of P- and D-state (J (P)=1/2 (+), T=1/2) components to the ground-state wave function of H3 and He3 on their magnetic moment form factors are calculated. It is found that these form factors cannot be accounted for in this way. Inclusion of the S' state and a typical T=3/2 state still leaves the magnetic form factors unexplained, although such an admixture is shown to account for the difference between the observed charge form factors. The empirical isoscalar and isovector exchange magnetic moment form factors that are needed to fit the experimental data are calculated. (Author)

AD-626 333 Fld. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND)
WEAK INTERACTIONS,
by P.. Matthews. 1965, 17p. Contract AF-EOAR-62-87
AFOSR 65-1781

Unclassified report

Availability: Published in Proceedings of the Royal Society (Ser A) v285 p214-28 (London) 1965. Copies to DDC users only.

Descriptors: (*Nuclear reactions, Elementary particles), Leptons, Bosons, Beta decay, Neutrinos, Meson capture, Muons

A review of the present status of weak interactions with particular reference to the implications of a currentcurrent interaction, the delta Y/delta Q rule for currents and the delta I = 1/2 rule for non-leptonic transitions. (Author)

AD-626 334 Fld. 20/8, 20/10
JOHNS HOPKINS UNIV BALTIMORE MD
U-SPIN AND THE MASS SPLITTING OF UNITARY MULTIPLETS,
by G. Feldman, and P. T. Matthews. 28 Aug 64, 14p. Contract AF-EOAR-62-87
AFOSR 65-1780

Unclassified report

Prepared in cooperation with Imperial Coll. of Science and Technology, London (England).

Availability: Published in Annals of Physics v31 n3 p46980 Feb 1965. Copies to DDC users only.

Descriptors: (*Nuclear energy levels, Perturbation theory), (*Nuclear spins, Mass number), Quantum mechanics, Groups (Mathematics), Baryons, Mesons, Bosons, Nuclear structure

The relations between the masses in a unitary multiplet are derived from the U- and I-spin properties of the mass splitting interactions. Various simple rules--the Parallelogram Law and the nth Difference Rule--are derived. It is shown that the Gell-Mann-Okubo formula is just an equal spacing rule for particles within a Umultiplet. (Author)

AD-626 335 Fld. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
INELASTIC BOUND-STATE SCATTERING IN SEPARABLE APPROXIMATION,
by J. T. Cushing. 26 Sep 64, 14p. Contract AF-EOAR-46-64
AFOSR 65-1855

Unclassified report

Availability: Published in Il Nuovo Cimento (Ser10) v36 p905-15 1 Apr 1965. Copies to DDC users only.

Descriptors: (*Inelastic scattering, Elementary particles), (*Elementary particles, Inelastic scattering), (*Approximation (Mathematics), Inelastic scattering), Momentum, Nuclear scattering

The inelastic contributions to the scattering amplitude describing the scattering of an elementary particle from a bound state are calculated explicitly from the Fadeev equations for separable interactions. The inelastic terms are then combined with the previously calculated elastic amplitude and the analytic properties of the complete amplitude are investigated in the static limit. The trajectories of the singularities of the partial-wave amplitude are shown to be bounded in the right-half plane of the total angular momentum. The model is applied to the scattering of a spinless elementary particle from a spinless compound one. The resulting amplitude is bounded by a finite power of cos theta sub 1 and independent of cos theta sub 2, where theta sub 1 and theta sub 2 are the xcattering angles of the scattered elementary particle and ejected bound particle, respectively. The possible applicability of the separable approximation used is discussed. (Author)

AD-626 336 Fld. 20/8, 20/10
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
U (12) IRREGULAR COUPLING FOR P-ANTIPANNIHILATION,
by F. Hussain, and P. Rotelli. 9 Apr 65, 5p. Contract AF-EOAR-46-64
AFOSR 65-1861

Unclassified report

Availability: Published in Physics Letters v16 n2 p183-4 15 May 1965. Copies to DDC users only.

Descriptors: (*Annihilation reactions, Protons), (*Antiprotons, Annihilation reactions), (*Groups (Mathematics), Quantum mechanics, Meson reactions, Field theory

Using irregular couplings, proton-antiproton annihilation at rest into two pseudoscalar particles is considered in the U (12) symmetry scheme. Under the assumption the ratio of annihilation rates is calculated to be 4:1. It is observed that the meson exchange mechanism proposed by Sawyer leads to the Johnson-Treiman relations and hence in the model to the result 4:1 since the annihilation process is just the crosschannel. Since the Johnson-Treiman relations were shown to hold in U (12) for all couplings, the result is independent of a model and appears as evidence for the validity of the approximate invariance of strong interactions in the U (12) theory. (Author)

AD-626 337 Fld. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
A MODEL FOR THE CONNECTED PART OF THE THREE-BODY AMPLITUDE,
by J. T. Cushing. 16 Jan 65, 23p. Contract AF-EOAR-46-64
AFOSR 65-1857

Unclassified report

Availability: Published in Il Nuovo Cimento (Ser10) v38 p463-82 1 Jul 1965. Copies to DDC users only.

Descriptors: (*Nuclear models, N-body problem), (*N-body problems, Nuclear scattering), Momentum, Integral transform, Matrix algebra

After a review of the conflicting results of some of the previous work on the analytic properties of the various nonrelativistic three-body amplitudes as functions of total energy and total angular momentum, a model involving separable interactions is proposed and the amplitude describing the scattering of three free particles into three free particles is constructed rigorously and exactly. That analytic continuation to complex total angular momentum, j, through an orbital angular momentum is taken, which some mathematically incomplete investigations have used to conclude meromorphy in the total angular momentum. In fact, this continuation does not produce an amplitude meromorphic in j but one which does not have a dominating Regge-type singularity. As a result a Sommerfeld-Watson transformation cannot be used to provide information about the asymptotic behavior as a momentum transfer tends to infinity. On the basis of this and previous work on the same model for the boundstate parts of the three-body amplitude, the analytic properties of all the three-body amplitudes are summarized. The Regge mechanism of asymptotic dominance appears valid only for the elastic bound-state scattering amplitude and even here there is competition between a pole and a cut. (Author)

AD-626 338 Fld. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
FORM FACTORS AND POLARIZATION EFFECTS IN NEUTRINO-INDUCED INTERACTIONS,
by I. J. Ketley. 7 Dec 64, 16p. Contract AF-EOAR-46-64
AFOSR 65-1858

Unclassified report

Availability: Published in Il Nuovo Cimento (Ser10) v38 p302-15 1 Jul 1965. Copies to DDC users only.

Descriptors: (*Neutrinos, Nuclear reactions), (*Nuclear structure, Polarization), Leptons, Baryons, Antiparticles

Form factors analogous to F sub C and F sub M in nucleon electromagnetic interactions are suggested for the vector and axial-vector currents at the strong vertex in a current-current theory of weak interactions. They are used to compute the cross-section and expressions for the covariant polarization four-vectors for the two final particles in the process neutrino (antineutrino) + nucleon to lepton + baryon with a view to determining the form factors and testing time-reversal invariance. (Author)

AD-626 339 Fld. 20/8, 20/10
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
U (12) SYMMETRY AND THE JOHNSON-TREIMAN RELATIONS,
by J. M. Charap, and P. T. Matthews. 1 Apr 65, 4p. Contract AF-EOAR-46-64

Unclassified report

Availability: Published in Physics Letters v16 n1 p95-6 1 May 1965. Copies to DDC users only.

Descriptors: (*Meson scattering, Groups (Mathematics)), (*Quantum mechanics, Elementary particles), Meson cross sections, Field theory, K mesons, Pions, Nuclear cross sections

It has been shown by Johnson and Treiman (AD-616 047) on the basis of SU (6) that Sigma (K (+))-Sigma (K (-)) = Sigma (K (0))-Sigma (K (0))+Sigma (pion (9100-Sigma (pion=) and Sigma (pion+))-Sigma (pion=)=Sigma (K (0))-Sigma (K (0)), where Sigma (M) stands for the total cross section of mesons M on protons. Though these relations were shown valid in the covariant U (12) theory when the forward scattering amplitudes were restricted to the four regular ones, the assumption implied zero polarization in several processes where the polarization was known to be large. Irregular forward scattering amplitudes are considered in U (12) theory as well as the regular. There are thirty different possibilities of which twelve contribute to Sigma (M)Sigma (anti-M). The relevant parts of each of these has the form of pure F-type baryon current coupled to the pure F meson current. Thus each term separately satisfies the Johnson-Treiman relations, which therefore remains valid in general in this theory. (Author)

AD-626 340 Fld. 20/8, 20/10
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
NEUTRINO-INDUCED INTERACTIONS AND U (12) SYMMETRY,
by I. J. Ketley. 4 May 65, 5p. Contract AF-EOAR-46-64 Proj. AF-9751 Task 975101
AFOSR 65-1862

Unclassified report

Availability: Published in Physics Letters v16 n3 p340-2 1 Jun 1965. Copies to DDC users only.

Descriptors: (*Neutrinos, Nuclear scattering), (*Nuclear structure, Groups (Mathematics)), Quantum mechanics, Field theory, Antiparticles, Strange particles, Baryons

In U (12) theory, the form factors associated with baryonbaryon and baryon-baryon resonance currents have been shown uniquely related. Using a current x current formulation for the weak interactions of leptons and hadrons, this relationship is used to obtain form factors applicable to neutrino interactions, and in particular to the processes neutrino (antineutrino) + N to lepton (lepton +) +N and neutrino (antineutrino) + N to lepton (lepton +) + N*. Equations for the vector and axial-vector currents are solved and used to compute cross sections for the above interactions. The elastic cross sections have a maximum near s 5 as usual computation given with similar form factors; but for very high energies there is a logarithmic behavior. The results for the inelastic process are similar to those using SU (6) to find the relative magnitude of the form factors. Agina for high energies the cross sections increase logarithmically. (Author)

AD-626 341 Fld. 20/8, 20/10
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
ON THE COVARIANT EXTENSION OF SU (6),
by J. M. Charap, and P. T. Matthews. 18 Mar 65, 15p. Contract AF-EOAR-46-64
AFOSR 65-1859

Unclassified report

Revision of manuscript submitted 24 Feb 1965.

Availability: Published in Proceedings of the Royal Society A v286 p300-12 1965. Copies to DDC users only.

Descriptors: (*Nuclear structure, Groups (Mathematics)), (*Tensor analysis, Nuclear structure), Invariance, Parity, Mesons, Baryons, Quantum mechanics, Nuclear reactions

The covariant generalizations of SU (6) invariant interactions are considered within the framework of U (6 x U (6). This group, in general, appears to lead to parity doubling for the mesons, but not the baryons. However, the parity doubling interpretation implies indefinite metric, which can be avoided by using the Bargmann-Wigner equations to eliminate the offending temrs. These equations relate sets of terms, which would together make multiplets of U (12), and the multiplets correspond physically to those of SU (6). Five different Yukawa interactions are derived, invariant with respect to U (6) x U (6), all of which have the SU (6) static limit. The linear combination of these is found which is invariant for U (12). (Author)

AD-626 342 Fld. 20/8, 20/10
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
VECTOR MESONS AND COMPLEX ANGULAR MOMENTUM,
by M. Martinis, and K. Ahmed. 22 Feb 65, 21p. Contract AF-EOAR-46-64
AFOSR 65-1859

Unclassified report

Availability: Published in Il Nuovo Cimento (Ser10) v38 p1021-39 16 Jul 1965. Copies to DDC users only.

Descriptors: (*Mesons, Momentum), (*Field theory, Mesons), Complex variables, Quantum mechanics, Meson scattering, Equations of motion, Elementary particles, Nucleons

The analytic behaviour in the complex angular momentum plane, of the amplitude for a vector meson coupled to a scalar 'nucleon' through a conserved current is examined. The graph with the exchange of two vector mesons is considered. This graph is iterated in the vector meson channel (called s channel). The partial wave projection of the lowest order graph (4th order) has a simple pole at l=1, which is obtained after an analytical continuation from higher l. When the singular part of the graph at l=1 is taken as the kernel of the Bethe-Salpeter equation it is found that for s not=6 mu-sq its solution has two simple moving poles in the neighbourhood of l=1 in the l-plane. However, the Regge trajectory has two branches which intersect each other at the branch point s=6mu-sq. (Author)

AD-626 343 Fld. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
MASS SPLITTING IN A BOOTSTRAP MODEL OF FOUR MULTIPLETS,
by Richard H. Capps. 12 Nov 64, 10p. Contract AF-EOAR-46-64
AFOSR 65-1852

Unclassified report

Availability: Published in The Physical Review v137 n6B pB1545-52 22 Mar 1965. Copies to DDC users only.

Descriptors: (*Nuclear resonance, Baryons), (*Nuclear energy levels, Perturbation theory), Mass number, Nuclear models, Mesons, Elementary particles, Approximation (Mathematics)

A bootstrap model of the pseudoscalar meson octet (P), vector meson octet (V), baryon octet (B), and baryon j (P)= 3/2 (+) decuplet (B*) is considered. A simple dynamical equation, used previously to predict the mass-splitting of the P and V multiplets, is applied to the B and B* multiplets. The approximations used are crude, but the calculated results agree closely with the experimental baryon masses. The main reasons for this agreement are expressed simply in terms of various Clebsch-Gordan coefficients of SU (3). The terms in the equation that are not linear in the mass splitting lead to an appreciable violation of the Gell-Mann-Okubo formula for the V mesons, and to negligible violations of the corresponding formulas for the B and B* multiplets. Matrix 1/ND dispersion relations are used to clarify the basic physical assumptions involved in the dynamical equation. (Author)

AD-626 345 Fld. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
ITERATED CROSSED BOX DIAGRAM IN THE COMPLEX ANGULAR MOMENTUM PLANE AND BETHE-SALPETER EQUATION,
by M. Martinis. 13 Jan 65, 18p. Contract AF-EOAR-46-64
AFOSR 65-1854

Unclassified report

Availability: Published in Commun. math. Phys. v1 p112-26 1965. Copies to DDC users only.

Descriptors: (*Elementary particles, Equations of motion), Relativity theory, Nuclear scattering, Complex variables, Momentum, Iterative methods

The analytic properties of the iterated crossed box diagram are considered in the complex angular momentum plane by using the partial wave Bethe-Salpeter equation. It is shown that the kernel of the Bethe-Salpeter equation is of the Hilbert-Schmidt type in the domain delta (l,s) = (l,s;Re l>-3/2;Ims not = 0) having a simple pole at l = -1. This pole produces in the whole amplitude a singularity found by Gribov and Pomeranchuk since the kernel is not of finite rank. (Author)

AD-626 350 Fld. 20/8
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS
A STUDY OF CONDUCTION ELECTRON POLARIZATION IN FERROMAGNETIC RARE EARTH METALS USING PERTURBATION OF CORRELATIONS,
by S. G. Cohen, N. Kaplan, and S. Ofer. 1965, 7p. Contract AF-EOAR-64-24
AFOSR 65-1764

Unclassified report

Availability: Published in Reprint. Copies to DDC users only.

Descriptors: (*Nuclear magnetic moments, Field theory), (*Ferromagnetic materials, Nuclear spins), (*Gamma emission, Perturbation theory), Magnetic fields, Lutecium, Hafnium, Rare earth elements

The effective magnetic fields H at 175Lu and 177Hf nuclei within diamagnetic ions, situated as dilute impurities in ferromagnetic rare earth metals, were determined using the technique of measuring the perturbation of the integral angular correlation of gamma - gamma cascades emitted from these nuclei, as a function of temperature, both in the presence of an external magnetic field and without an external field. From these results it can be concluded that the effective field in all cases is negative, i.e. opposite to the magnetization, that the magnitude of H is proportional to the magnetization, at least in the case of Gd host metal, and that for 177Hf the magnitude of H follows very roughly the magnitude of the spin S of the magnetic host. If we assume that the main contribution to Heff is due to polarized conduction electrons, it can be shown that within the Kasuya-Yosida model, the effective s-f exchange interaction is negative and of the order of -0.1 eV. (Author)

AD-626 356 Fld. 20/8
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
DISPERSION THEORY AND THE NUCLEAR MANYBODY PROBLEM,
by C. D. Froggatt. 12 May 64, 15p. Contract AF-EOAR-79-63 Proj. AF-9750 Task 975001
AFOSR 65-1757

Unclassified report

Availability: Published in Nuclear Physics v61 p303-15 1965. Copies to DDC users only.

Descriptors: (*Nuclear scattering, N-body problem), (*N-body problem, Nuclear scattering), Potential theory, Quantum mechanics, Electromagnetic properties, Nuclear structure; Iterative methods

The Hartree self-consistency equations are derived as the non-relativistic, no-recoil limit of the dispersion analysis of nuclear electromagnetic form factors described by Eden and Goldstone. A class of internucleon potentials is found, for which the iterative solution of these equations is convergent and retains the essential analyticity properties of dispersion theory. (Author)

AD-626 377 Fld. 20/8
STANFORD RESEARCH INST MENLO PARK CALIF
PERTURBATION INDUCED IN ELASTIC SCATTERING BY CROSSING OF MOLECULAR STATES,
by F. T. Smith, D. C. Lorents, W. Aberth, and R. P. Marchi. 28 Sep 65, 5p. Contract DA-31-124-ARO (D)-83
AROD 3251:4

Unclassified report

Availability: Published in Physical Review Letters v15 n19 p742-6 Nov 8 1965. Copies to DDC users only.

Descriptors: (*Helium, Elastic scattering), (*Molecular energy levels, Elastic scattering), Perturbation theory, Transport properties, Probability

AD-626 414 Fld. 20/8, 20/7
CFSTI Prices: HC $1.00 MF $0.50
HARVARD UNIV CAMBRIDGE MASS CYCLOTRON LAB
QUARTERLY PROGRESS REPORT.
Rept. for 1 Sep-30 Nov 65.
30 Nov 65, 12p. Proj. NR-026-012

Unclassified report

Descriptors: (*Nuclear reactions, Scientific research), (*Proton beams, Nuclear reactions), (*Molecular beams, Nuclear properties), Cyclotrons, Proton reactions, Bremsstrahlung, Scintillation counters, Neutron beams, Nuclear cross sections, Nuclear scattering, Nuclear resonance, Resonance absorption, Nuclear magnetic moments, Hydrogen, Masers

Research progress is reported on the following topics: the cyclotron, knockout reactions, proton-proton bremsstrahlung, nuclear interactions in scintillators, monokinetic neutron beam, n-p incoherent cross section, biological uses of proton beams, gravitational red shift apparatus, resonant absorption in Sn 119 at low temperatures, nuclear magnetism in solid H2, properties of nuclei, nuclear interactions in molecules, and atomic hydrogen maser.

AD-626 426 Fld. 20/8
CONNECTICUT UNIV STORRS DEPT OF PHYSICS
MEASUREMENTS OF RESONANT ELECTRON CAPTURE IN CLOSE H+-ON-H COLLISIONS,
by Herbert F. Helbig, and Edgar Everhart. 4 Jun 65, 6p. Contract DA-ARO (D)-31-124-G685
AROD 2805:13

Unclassified report

Availability: Published in The Physical Review v140 n3A pA715-20 Nov 1 1965. Copies to DDC users only.

Descriptors: (*Electron capture, Protons), (*Proton scattering, Hydrogen), Resonance scattering, Differential cross section, Probability, Deuteron scattering, Deuterium

Differential measurements of the electron capture probability P are made for protons scattered from atomic hydrogen targets. The incident proton energy ranges from 150 keV down to 0.130 keV and the scattering angle is varied between 0.2 deg. and 6.0 deg. Seven sharply resonant peaks of P are found, their location depending on both energy and angle. For example, when the scattering angle is held at 6 deg. the peaks are found at 21, 3.9, 1.7, 0.90, 0.54, 0.36, and 0.19 keV, and when the energy is fixed at 0.250 keV, peaks are found at 0.7, 1.4, 2.6, and 4.5 deg. In some cases the equivalent collision with deuterium, D (+)-D, is used to augment the range of the measurements. These data extend those reported by Lockwood and Everhart (1962) who studied this same phenomenon in H (+)-H collisions over a smaller range in energy and at fixed 3 deg. scattering angle. Relative differential-cross-section data are presented also which show a change in slope with the onset of rainbow-angle scattering conditions. (Author)

AD-626 455 Fld. 20/8
CALIFORNIA INST OF TECH PASADENA
A COMPARISON OF THE MIRROR REACTIONS 10B (D,3HE)9BE AND 10B (D,T)9B,
by G. D. Symons. 20 Jul 65, 2p. Contract Nonr-220 (47)

Unclassified report

Availability: Published in Physics Letters v18 n2 p142-3 15 Aug 1965. Copies to DDC users only.

Descriptors: (*Deuteron reactions, Boron), Beryllium, Nuclear scattering, Tritons, Helium, Nuclear energy levels

The results are described of a comparative study of the 10B (d,3He)9Be and 10B (d,t)9B reactions for similar energy regions of the mirror nuclei 9Be and 9B.

AD-626 456 Fld. 20/8
CALIFORNIA INST OF TECH PASADENA
A STUDY OF THE LI7 (HE3,N) B9 REACTION BY TIME-OF-FLIGHT TECHNIQUES,
by Frank S. Dietrich. 18 Jan 65, 20p. Contract Nonr-220 (47)

Unclassified report

Availability: Published in Nuclear Physics v69 n1 p49-67 1965. Copies to DDC users only.

Descriptors: (*Neutron scattering, Lithium), (*Nuclear energy levels, Boron), Helium, Beryllium, Neutron spectrum, Nuclear structure

The Li7 (He3, n)B9 reaction has been investigated at incident energies from 5.2 to 12.5 MeV, using a pulsedbeam time-of-flight spectrometer in conjunction with the ONR-CIT tandem accelerator. The spectrometer includes a pre-acceleration beam-bunching system, which increases the average target current by a factor of approximately 10 for protons and deuterons, and 4 for He3 and alpha beams. Previously unreported B9 levels were found at excitation energies of 12.06=0.06, 14.01=0.07, 14.670=0.016 and 16.024=0.025 MeV, with widths of 800=200, 390=110, <45 and 180=16keV, respectively. At 12.5 MeV bombarding energy, covering the range of excitation of B9 up to 17.9 MeV, two additional neutron groups corresponding to known B9 states at 17.19 and 17.63 MeV were observed. The neutron groups were superimposed on an intense background continuum, attributable to processes leading to the final configuration 2 alpha +p+n. An angular distribution, at 8.7 MeV incident energy,of the neutrons leading to the 14.67 MeV state is roughly isotropic in the centreof-mass system, and the total cross section is 8 mb. AT = 3/2 assignment for the 14.67 MeV state is suggested by its narrow width, and by recent studies of the Li7 (t,p) Li9 and Li7 (He3, p)Be9 reactions. A comparison of the Li7 (He3, p)Be9 and Li7 (He3, n)B9 reactions shows that the cross sections for formation of the 14.67 MeV B9 state and the analogous Be9 state are approximately equal, if barrier-penetration effects in the outgoing channels are removed. (Author)

AD-626 457 Fld. 20/8, 3/2
CALIFORNIA INST OF TECH PASADENA
THE CAPTURE OF PROTONS BY BE7,
by T. A. Tombrello. 20 Jan 65, 7p. Contract Nonr-220 (47)

Unclassified report

Availability: Published in Nuclear Physics v71 n2 p45964 1965. Copies to DDC users only.

Descriptors: (*Proton capture, Beryllium), Stars, Proton reactions, Lithium, Gamma-neutron reactions, Gammaproton reactions

The capture of low-energy protons by Be7 is calculated using a single-particle model for the ground state of B8. All the model parameters are determined from the experimental data for the reactions Li7 (n, n)Li7 and Li7 (n, gamma)Li8. The calculated results for Be7 (p, gamma) B8 are in agreement with the experimental data that are available and permit an extrapolation to energies corresponding to stellar temperatures. (Author)

AD-626 458 Fld. 20/8
CALIFORNIA INST OF TECH PASADENA
RESONANCES NEAR THRESHOLD AND S-MATRIX THEORY,
by Hans A. Weidenmuller. 4 Jan 65, 19p. Contract Nonr-220 (47)

Unclassified report

Availability: Published in Nuclear Physics v69 n1 p113-30 1965. Copies to DDC users only.

Descriptors: (*Nuclear resonance, S-matrix), (*S-matrix, Nuclear resonance), Nuclear cross sections, Nuclear binding energy

Threshold effects on nuclear reaction cross sections are re-examined in the frame of S-matrix theory. The Thomas-Ehrmann shift is rederived. The behaviour of poles of the S-matrix near thresholds, their distribution on the sheets of the Riemann surface and their influence on nuclear cross sections are investigated. The possibility of the occurrence of 'threshold states' and of 'virtual states' is discussed. The effect of the large number of thresholds encountered in the investigation of statistical fluctuations of nuclear cross sections on the average width of the compound nucleus is found to be negligible. (Author)

AD-626 484 Fld. 20/8, 20/10
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
ANALYTIC PROPERTY OF THREE-BODY UNITARITY INTEGRAL,
by Jamal N. Islam, and Y. S. Kim. 18 Jan 65, 9p. Contract AF-AFOSR-500-64 Proj. AF-9751 Task 975101
AFOSR 65-1819

Unclassified report

Availability: Published in Physical Review v138 n5B pB1222-B9 Jun 7 1965. Copies to DDC users only.

Descriptors: (*Nuclear scattering, N-body problem), (*Integrals, Nuclear scattering), Perturbation theory, Elementary particles

Analytic properties of the three-body unitarity integral are studied for the production amplitude corresponding to one-particle-exchange diagrams. The condition under which the absorptive part has singularities is discussed. For a simple degenerate case, it is shown that the singularity curve can be represented by an explicit elementary function. It is shown further that this singularity curve is identical to that from the conventional Landau-Bjorken analysis. (Author)

AD-626 487 Fld. 20/8
FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)
ELASTIC AND ELECTROMAGNETIC PROTON INTERACTIONS AT 3 TEV,
by C. B. A. McCusker, L. S. Peak, and R. L. S. Woolcott. 25 Feb 65, 9p. Contract AF-AFOSR-305-63 Proj. AF-9774 Task 977402
AFOSR 65-1812

Unclassified report

Availability: Published in Australian Journal of Physics v18 n3 p277-82 Jun 1965. Copies to DDC users only.

Descriptors: (*Proton reactions, Elastic scattering), Field theory, Pair production, Probability, Cosmic rays, Ionization trails

The results are presented of a line scan, in nuclear emulsion, of protons of average energy 3 TeV. No elastic scatters were detected in the scanned length of 594 cm. The probability is calculated of detecting an elastic scatter in emulsion, and hence that the proton-proton elastic cross section at 3 TeV is < 5 mbn. Five examples of proton direct pair production were found in the above path length. It is shown that this result is consistent with the predictions of quantum electrodynamics. (Author)

AD-626 498 Fld. 20/8, 20/10
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND)
ELECTROMAGNETIC INTERACTION OF MESONS RESULTING FROM A BROKEN SYMMETRY,
by G. S. Guralnik. 10 Oct 64, 16p. Contract AF-EOAR-46-64
AFOSR 65-1856

Unclassified report

Availability: Published in Il Nuovo Cimento, v36 n10 p1002-15 1 Apr 65. Copies to DDC users only.

Descriptors: (*Meson reactions, Electromagnetic properties), Green's function, Perturbation theory, Quantum mechanics, Field theory, Pions

The Nambu, Jona-Lasinio broken symmetry theory is restated in terms of Green's functions in the presence of an external current source. Using these Green's functions, it is possible to calculate the lowest-order effects of electromagnetic interactions on the initially massless pseudoscalar mesons induced by the broken symmetry. It is found that the uncharged meson acquires no mass and hence the results are consistent with the Goldstone theorem applied to the fully interacting system. (Author)

AD-626 512 Fld. 20/8, 20/10
BOSTON UNIV MASS DEPT OF PHYSICS
ELECTROMAGNETIC MASS CORRECTIONS IN THE COVARIANT SV (12) SCHEME,
by P. Roman, and J. J. Aghassi. 4 Mar 65, 6p. Contract AF-AFOSR-385-63 Proj. AF-9751 Task 975101
AFOSR 65-1870

Unclassified report

Availability: Published in Il Nuovo Cimento v37 (s10) p354-7 May 1965. Copies to DDC users only.

Descriptors: (*Mass-energy relation, Nuclear structure), (*Field theory, Groups (Mathematics)), Electromagnetic properties, Tensor analysis, Corrections, Pergurbation theory, Quantum mechanics

Electromagnetic effects are considered in the SV (12) symmetry scheme, a covariant merging of space-time and SU (3) symmetries within a framework which uses the de Sitter group for a background. The electromagnetic mass-splitting operator is taken, to transform as the charge operator Q and it is convenient to evaluate this by using the U-spin formalism. The complete mass formula is obtained and its constants determined for the 143 and 364 baryon supermultiplets. Electromagnetic sum rules are discussed. The principal result is that electromagnetic mass splitting can be related in different spin submultiplets. (Author)

AD-626 513 Fld. 20/8, 20/10
BOSTON UNIV MASS DEPT OF PHYSICS
D/F RATIOS AND BARYON MAGNETIC MOMENTS IN THE SV (12) SCHEME,
by P. Roman, and J. J. Aghassi. 26 May 65, 6p. Contract AF-AFOSR-385-63 Proj. AF-9751 Task 975101
AFOSR 65-1869

Unclassified report

Availability: Published in Il Nuovo Cimento v38 (s10) p1092-5 Jul 1965. Copies to DDC users only.

Descriptors: (*Baryons, Nuclear magnetic moments), (*Field theory, Groups (Mathematics)), Meson scattering, Quantum mechanics, Nuclear structure

Some dynamical predictions are calculated for the baryon-meson vertices in the SV (12) symmetry scheme. Breaking down SV (12) into SU (3) x L (5) and noting that the algebra of L5 is locally isomorphic with that of Sp4, the equation for the (8, 4) baryon current is formulated. Solving this equation, the D/F ratio for the NNM vertex is determined to be 4:3. The baryon magnetic moments are calculated and, invoking the usual SU (3) identifications, are presented in arbitrary units. The results are compared to SU (6) theory, and though there is considerable agreement, a value of -1.62 is obtained for mu (p)/mu (n) which disagrees with both the SU (6) prediction and the even smaller experimental values. Thus it is concluded that though the scheme yields an excellent classification of states and an accurate mass formula, it probably is not accurate for grasping intricate features of dynamics at high energy. (Author)

AD-626 515 Fld. 20/8
CORNELL UNIV ITHACA N Y
A KINETIC DESCRIPTION OF THE VAN HOVE CORRELATION FUNCTIONS,
by M. Nelkin, J. M. J. Van Leeuwen, and S. Yip. 1965, 29p. Contract AT (30-1)-3326 Grant ,AF-AFOSR-324-63
AFOSR 65-1961

Unclassified report

Availability: Published in Inelastic Scattering of Neutrons v2 p35-58 1965. Copies to DDC users only.

Descriptors: (*Statistical functions, Kinetic theory), (*Kinetic theory, Inelastic scattering), (*Neutrons, Inelastic scattering), Fluid mechanics, Statistical mechanics, Distribution functions

AD-626 525 Fld. 20/8, 18/4
WASHINGTON UNIV SEATTLE
DISCUSSION OF FACTORS AFFECTING THE ABSOLUTE ACCURACY OF MOSSBAUER F MEASUREMENTS,
by R. M. Housley. 17 Dec 64, 9p. Contract AF49 (638)-1004 Grant ,AF-AFOSR-594-64
Proj. AF-9763 Task 976303
AFOSR 65-1966

Unclassified report

Availability: Published in Nuclear Instruments and Methods v35 n1 p77-82 1965. Copies to DDC users only.

Descriptors: (*Mossbauer effect, Measurement), Gamma rays, Resonance absorption, Inelastic scattering, Nuclei, Gamma-ray cross sections, Resonance scattering, Compton scattering

The possible influence of Mossbauer f measurements of self absorption and inelastic scattering in the source and of reemission, inelastic scattering and non-resonant nuclear absorption in the absorber are considered. (Author)

AD-625 701 See Fld. 4/1

AD-625 702 See Fld. 4/1

AD-625 714 See Fld. 6/18

AD-625 931 See Fld. 7/4

AD-625 952 See Fld. 5/1

AD-625 960 See Fld. 4/1

AD-626 000 See Fld. 7/4

AD-626 100 See Fld. 20/10

AD-626 205 See Fld. 4/1

AD-626 231 See Fld. 20/9

AD-626 260 See Fld. 20/13

AD-626 297 See Fld. 20/10

AD-626 348 See Fld. 7/4

AD-626 359 See Fld. 20/10

AD-626 454 See Fld. 20/10

AD-626 461 See Fld. 3/2

AD-626 491 See Fld. 4/1

AD-626 553 See Fld. 20/12

AD-626 564 See Fld. 3/2

20/9. PLASMA PHYSICS

AD-625 789 Fld. 20/9
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SOURCE OF GAS DISCHARGE PLASMA,
by Yu. V. Kubarev. 27 Oct 65, 6p. Rept. no. FTD-TT-65-806
TT 66-60137

Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 974, appl. no. 818030/26-25, 4 Nov 63.

Descriptors: (*Plasma generators, Gas discharges), Electrodes, Patents, Gas ionization, Pipes, Ceramic materials, USSR

The object of the invention is a source of gas-discharge plasma of continuous action consisting of a hermetically closed ceramic tube located in a nonuniform magnetic field inside of which there is placed a discharge chamber which contains an anode and a cathode of direct incandescence and a system of auxiliary electrodes. For the purpose of increasing the degree of ionization of the gas and the speed of the plasma stream of the source in it on the output, there is located an ionization chamber the housing of which brought a throw-over switch is connected up to the anode and in which there is an inlet opening for the operative gas. (Author)

AD-625 807 Fld. 20/9, 20/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MEASUREMENT OF ELECTRON TEMPERATURE IN A CESIUM LOW-VOLTAGE ARC,
by Yu. K. Guskov, and A. I. Kiryushchenko. 20 Dec 65, 9p. Rept. no. FTD-TT-65-1969
TT 66-60151

Unclassified report

Unedited rough draft trans. of unidentified Russian mono., 1965 8p.

Descriptors: (*Plasma medium, Temperature), (*Electric arcs, Temperature), (*Cesium, Gas discharges), Vapors, Electrons, Zinc, Recombination reactions, USSR

Results are presented of the measurement of the electron temperature in a low-voltage arc in vapors of cesium with an admixture of zinc, in accordance with the recombination continuum.

AD-625 897 Fld. 20/9, 20/3, 4/1
CFSTI Prices: HC $6.00 MF $1.25
MICHIGAN UNIV ANN ARBOR RADIATION LAB
UNIFIED APPROACH TO EXCITATION PROBLEMS IN COMPRESSIBLE PLASMA.
Summary rept.,
by Y-K Wu. Nov 65, 227p. Rept. no. ORA-6663-1-T
Contract AF30 (602)-3381 Proj. AF-5579 Task 557902
RADC TR-65-353

Unclassified report

Descriptors: (*Field theory, Plasma physics), (*Excitation, Plasma physics), (*Plasma physics, Excitation), Propagation, Equations of motion, Compressible flow, Magnetohydrodynamics, Electron density, Ionosphere, Atmosphere models, Numerical analysis

This investigation is concerned primarily with the general, unified approach to the solution of excitation problems in a compressible plasma which may be inhomogeneous and include different types of sources, e.g. electric current source, magnetic current source, fluid approach is chosen and is based on the linearized Euler equations of motion and the Maxwell equations. The Maxwell-Euler equations are reformulated through linear operator and generalized transform techniques into an equivalent matrix integral equation, which can be solved recursively for a general linear plasma medium. When the medium is homogeneous, this integral equation has a degenerate kernel and the explicit solution can be easily obtained. A thorough study is given for the excitation of disturbances due to different types of sources in a homogeneous electron plasma externally impressed by a constant magnetic field. The dispersion relations for the three types of waves involved in an electron plasma are studied carefully and a proper terminology introduced. The radiation field is then solved for both two- and threedimensional excitation problems. Equivalence relations between different types of sources are also obtained. The numerical result shows that a large portion of energy radiation is in an acoustic type wave. (Author)

AD-625 938 Fld. 20/9
CFSTI Prices: HC $2.00 MF $0.50
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
MAGNETOGASDYNAMIC HYPERCRITICAL FLOWS WITH SHOCKS.
Annual summary rept.,
by Nima Geffen. May 65, 38p. Rept. no. TAE-41
Contract AF-EOAR-78-64
AFOSR 65-1798

Unclassified report

Descriptors: (*Magnetohydrodynamics, Gas flow), (*Slender bodies, Magnetohydrodynamics), Two-dimensional flow, Wedges, Digital computers, Israel, Shock waves, Numerical analysis

Two dimensional, steady, non-dissipative magnetogasdynamic flow around given slender bodies is investigated in the hypercritical (near A sq + M sq = 1) approximation. Similarity parameters are obtained by a simple method, and the flow over a double-wedge is formulated in the physical and in the hodograph planes. Two methods of solution are proposed, and a procedure for a digital computer given. (Author)

AD-625 945 Fld. 20/9, 14/2
CFSTI Prices: HC $3.00 MF $0.75
HARRY DIAMOND LABS WASHINGTON D C
MICROWAVE MEASUREMENTS OF THE ELECTROMAGNETIC PROPERTIES OF SHOCKED AIR IN THE RANGE 8 = MS = 12 AND 1 = P; = 20MM,
by Frank L. Tevelow. 30 Aug 65, 72p. Rept. no. TR-1301
Proj. DA-1A010501B010 ,HDL-36600

Unclassified report

Descriptors: (*Microwave bridges, Plasma physics), (*Probes (Electromagnetic), Plasma physics), (*Plasma physics, Probes (Electromagnetic)), Shock (Mechanics), Gas ionization, Electrical properties, Microwaves, Propagation, Plasma medium

Microwave transmission measurements of the electrical properties of shock-ionized air in the range 8 < or = M sub s < or = 12 and initial pressures of 1, 2, 5, 10, and 20 mm Hg are presented. The test arm of the microwave transmission bridge is x-band waveguide, which passes through the shock tube and has an affixed nozzle to section out a portion of the shocked gas. This gas is constrained to a rectangular cross section and passes through the waveguide where it interacts with the microwave signal. A 1/2-in. and a 1 1/2-in. nozzle are used, and it is shown that nozzle length has a negligible effect on both the ionization rate and the level. The data are presented in terms of dielectric constant, electron density, collision frequency, conductivity, attenuation, and reflection coefficient. The data are compared with results obtained from other experimental methods and discrepancies are noted. Ionization profiles obtained from the microwave measurements at 1 mm agree below M sub s = 11 with calculations made using the rate program of Garr and Marrone. Evaluation of ionization profiles in terms of rate constants is complicated at all pressures by the effects of accelerating shocks. (Author)

AD-625 977 Fld. 20/9
COLUMBIA UNIV NEW YORK ELECTRONICS RESEARCH LABS
DETERMINATION OF DIRECT CURRENT ARC PLASMA CURRENT DENSITY BY HALL-EFFECT MAGNETIC PROBE,
by Pin-Seng Tschang. 11 Sep 64, 7p. Contract AF49 (638)-1395 ,AF33 (615)-1141 Proj. AF9783 Task 978302
AFOSR 65-1745

Unclassified report

Availability: Published in AIAA Journal v3 n5 p849-52 May 1965. Copies to DDC users only.

Descriptors: (*Electrics, Plasma physics), (*Plasma medium, Direct current), (*Probes (Electromagnetic), Hall effect), Magnetic fields, Electric currents, Density

A simple and novel method of determining the current density of the cylindrical plasma column of an electric arc, based on the measurement of the self-magnetic field due to the arc drift current, is presented. This is accomplished by means of a miniature Hall-effect magnetic probe traversing the column diametrally at approximately 120 cm/sec. The theory of the Hall probe is briefly sketched and the method of data reduction given. The probing unit was tested on the plasma column of the fluid-transpiration arc. Results of several representative probings are presented showing general conformity to theory of the arc self-magnetic field radial profile. The results indicate the fluid-transpiration arc current density to be remarkably uniform over a large cross section of the column. The perturbative effects of the probe insertion on the plasma are analyzed. The advantages of using Hall probes as against coil-type magnetic probes are examined. (Author)

AD-625 992 Fld. 20/9
TRW SPACE TECHNOLOGY LABS REDONDO BEACH CALIF
GENERATION AND DIAGNOSIS OF SYNTHESIZED PLASMA STREAMS,
by J. M. Sellen,Jr., W. Bernstein, and R. F. Kemp. 17 Aug 64, 7p. Contract AF49 (638)-886 ,AF49 (638)-1368
AFOSR 65-1807

Unclassified report

Availability: Published in The Review of Scientific Instruments v36 n3 p316-22 Mar 1965. Copies to DDC users only.

Descriptors: (*Plasma medium, Synthesis), Plasma generators, Ionization, Ions, Electrons, Cesium, Langmuir probes

A contact-ionization source is described which generates a cesium ion stream characterized by a high degree of order in the ion motion. Electrons are added to form a quiescent, collisionless plasma stream. Diagnostic instruments are described for demonstrating the properties of the plasma streams. Ion densities range from 50,000,000 to 1 x 10 to the -11th power ions/cu cm in the source region, at accelerating voltages from 100 V to a few thousand volts, depending on the experimental application. Conical expansion of the beam reduces the densities in downstream regions. Electron temperatures in the beams range downward from the approximate 2500K emissive wire temperature. Means are described for increasing electron temperatures to several times this value, with resultant increase in beam divergence. (Author)

AD-626 132 Fld. 20/9, 20/12
SOCIETE FRANCAISE DE PHYSIQUE PARIS
INTERNATIONAL CONFERENCE ON THE PHYSICS OF SEMICONDUCTORS (7TH). 2. PLASMA EFFECTS IN SOLIDS.
1964, 229p. Contract AF-EOAR-26-64 Proj. AF-9763 Task 976302
AFOSR 65-0723

Unclassified report

Symposium (1st) held at Paris, 16-17 Jul 64.

Availability: Dunod, Editeur, 92 Rue Bonaparte, Paris 6, France.

Descriptors: (*Plasma physics, Solids), Wave transmission, Solid state physics, Quantum mechanics, Plasma oscillations, Stability, France

The symposium on Plasma effects in solids was the first of its kind. It was an attempt to bring together two rather distinct groups of people: plasma and solidstate physicists; their common interest being the study of the gas of free charged carriers in solids. One hundred and fifty physicists from about twenty countries attended the conference. Twenty five papers were presented and appreciable time was allotted to the following discussions: wave propagation in solid state plasmas, wave interactions, quantum effects, hot plasmas, and instabilities. (Author)

AD-626 231 Fld. 20/9, 20/8
VERMONT UNIV BURLINGTON DEPT OF PHYSICS
KINETIC EQUATION WITH RELATIVISTIC INTERACTION CORRECTIONS FOR A PLASMA,
by John E. Krizan. 21 Jun 65, 6p. Contract DA-31-124-ARO (D)-172
AROD 4403:5

Unclassified report

Availability: Published in The Physical Review v140 n4A pA1155-60 Nov 15 1965. Copies to DDC users only.

Descriptors: (*Plasma medium, Statistical mechanics), (*Equations of motion, Charged particles), (*Relativity theory, Plasma medium), Transport properties, Hamiltonian, Approximation (Mathematics)

Using the formalism of Weinstock, a master equation for a momentum-dependent interaction is given. An exact kinetic equation (to lowest order in -sq) for a homogeneous plasma in which relativistic interaction corrections to order (v/c) -sq are included is also given. It is readily shown that with the relativistic approximation the well-known divergences of the kinetic equation are removed without invoking cutoffs (as is also true in the nonrelativistic case given by Weinstock). (Author)

AD-626 344 Fld. 20/9, 14/2
ELECTRO-OPTICAL SYSTEMS INC PASADENA CALIF FLUID PHYSICS DIV
PROTON BEAM TECHNIQUE FOR MEASURING THE ION DENSITY IN A PLASMA,
by Donald P. Duclos. 14 Dec 64, 6p. Contract AF49 (638)-1063
AFOSR 65-2258

Unclassified report

Availability: Published in The Review of Scientific Instruments v36 n6 p806-9 Jun 1965. Copies to DDC users only.

Descriptors: (*Proton beams, Probes), (*Probes, Plasma physics), (*Plasma physics, Probes), Plasma accelerators, Ions, Density, Measurement

A technique is described for obtaining localized measurements of the ion density in a plasma which is not affected by the presence of a magnetic field or the absence of thermodynamic equilibrium. The technique consists basically of exciting the ions with a proton beam and relating the measured absolute intensity of certain spectral lines to the ion density. Three requirements are discussed which must be satisfied in order to apply the method to a particular gas. The technique appears to be well suited to measuring the density of helium ions. The possible sources of error are examined and, for helium plasmas, none of the errors are large provided that the gas pressure is less than 1 mm Hg and the temperature is over 10 000 K. A preliminary experiment is described. (Author)

AD-626 390 Fld. 20/9
TEXAS UNIV AUSTIN DEPT OF PHYSICS
DENSITY MODULATIONS IN RADIO FREQUENCY PLASMAS,
by H. Schluter, J. Durham, and C. J. Ransom. 31 Mar 65, 3p. Contract DA-ARO (D)-31-124-G438
AROD 4159:2

Unclassified report

Availability: Published in The Physics of Fluids, v8 n8 Aug 1965. Copies to DDC users only.

Descriptors: (*Plasma medium, Radiofrequency), Density, Plasma oscillations, Modulation

AD-626 392 Fld. 20/9
GENERAL ATOMIC SAN DIEGO CALIF JOHN JAY HOPKINS LAB FOR PURE AND APPLIED SCIENCE
WAVE-WAVE SCATTERING OF BEAM AND PLASMA OSCILLATIONS,
by R. E. Aamodt, and W. E. Drummond. 7 Aug 64, 8p. Contract AF49 (638)-1356 Proj. AF-9752 Task 975201
AFOSR 65-2502

Unclassified report

Availability: Published in The Physics of Fluids v8 n1 p171-6 Jan 1965. Copies to DDC users only.

Descriptors: (*Plasma oscillations, Scattering), High frequency, Magnetic fields, Energy, Spectroscopy, Equations

The spreading of the high-frequency electron plasma oscillation energy spectrum due to nonlinear interactions with a low-frequency beam mode is calculated for a homogeneous collisionless plasma with a large external magnetic field. (Author)

AD-625 969 See Fld. 20/14

AD-626 144 See Fld. 20/14

AD-626 196 See Fld. 20/14

AD-626 197 See Fld. 20/14

20/10. QUANTUM THEORY

AD-625 698 Fld. 20/10, 12/1
TORINO UNIV (ITALY) ISTITUTO DI FISICA
ON THE RACAH ALGEBRA FOR THE GROUP R4,
by G. Ponzano. 24 Nov 64, 3p. Contract AF-EOAR-39-64 Proj. AF-9751 Task 975101

Unclassified report

Availability: Published in Il Nuovo Cimento (Ser10) v35 p1231-3 16 Feb 1965. Copies to DDC users only.

Descriptors: (*Algebra, Groups (Mathematics)), (*Quantum mechanics, Algebra), (*Groups (Mathematics), Quantum mechanics), Momentum, Operators (Mathematics), Rotation, Invariance, Nuclear spectroscopy

The 6j-symbol for the group R4 is explicitly calculated and the properties of the Racah algebra of compact simply reducible groups are verified. Owing to the isomorphism R4 approx. = R3 x R3, it is expected that R4 invariants can be expressed in terms of the corresponding ones for R3. From the R4 Wigner coefficient, the 3nj-symbols for R4 are given by the product of two R3 3nj-symbols of the same type with different arguments. The result is illustrated with graphical representations. (Author)

AD-625 699 Fld. 20/10, 12/1
TORINO UNIV (ITALY) ISTITUTO DI FISICA
A CONTRIBUTION TO THE STUDY 21-J COEFFICIENTS,
by G. Ponzano. 10 Aug 64, 7p. Contract AF-EOAR-39-64 Proj. AF-9751 Task 9751-01
Unclassified report

Availability: Published in Il Nuovo Cimento (Ser 10) v36 p385-91 16 Mar 1965. Copies to DDC users only.

Descriptors: (*Quantum mechanics, Momentum), (*Momentum, Operators (Mathematical)), Rotation, Nuclear spectroscopy, Nuclear spins

Eight different kinds of 21-j symbols are considered: their graphical representations and symmetries are studied in detail; expressions in terms of lower-order symbols are given as well. (Author)

AD-625 962 Fld. 20/10, 12/1, 7/4
AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC N J
GLOBAL MASTER EQUATION. II,
by G. Sandri. 2 Jan 64, 14p. Contract AF49 (638)-1224
AFOSR 65-1741
Unclassified report

Availability: Published in Il Nuovo Cimento (Ser 10) v36 p309-21 Mar 16 1965. Copies to DDC users only.

Descriptors: (*Statistical mechanics, Partial differential equations), (*Partial differential equations, Statistical mechanics), Momentum, Distribution funtions, Hamiltonian, Perturbation theory, Power series

The structure of the global master equation is clarified by means of a projection operator formalism which permits exhibiting the physical meaning of the quantities that appear in the evolution of the momentum distribution. With the help of a new formulation, the author gives an explicit form to the H-theorem for the master equation and calculates to first order the effect of phase mixing on the propagator. (Author)

AD-625 963 Fld. 20/10, 12/1, 7/4
AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC N J
A NEW METHOD OF EXPANSION IN MATHEMATICAL PHYSICS. I.,
by G. Sandri. 2 Jan 64, 30p. Contract AF49 (638)-1224
AFOSR 65-1742
Unclassified report

Availability: Published in Il Nouvo Cimento Series 10 v36 p67-93 Mar 10 1965. Copies to DDC users only.

Descriptors: (*Statistical mechanics, Perturbation theory), (*Perturbation theory, Statistical mechanics), Taylor's series, Integral transforms, Power series, Physics

The general method for uniformizing perturbation expansions introduced recently (method of extension) is further developed. The presentation given in this paper is self-contained and does not rely on explicit use of composition of mappings. The compatibility conditions that the method gives rise to are discussed and so is the basic induction theorem. A new very general uniformizing formula is derived. The PoincareLighthill procedure is deduced from this formula in a simpler fashion than in the previous paper. A general theory for the Fourier transforms of extended functions is developed. (Author)

AD-626 060 Fld. 20/10
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
SPECIAL CLASS OF FEYNMAN INTEGRALS IN TWO-DIMENSIONAL SPACE-TIME,
by G. Kallen, and J. Toll. 26 May 64, 7p. Contract AF AFOSR-500-64 ,NSF-GP-1193
AFOSR 65-1816
Unclassified report

Availability: Published in Journal of Mathematical Physics, v6 n2 p299-303 Feb 1965. Copies to DDC users only.

Descriptors: (*Integrals, Quantum mechanics), (*Quantum mechanics, Integrals), Algebra, Field theory

Contributions of Feynman diagrams consisting of a single loop with an arbitrary number of vertices are explicitly evaluated in two-dimensional space-time. The result can be written as a sum of logarithms multiplied by algebraic expressions. Each logarithm is characteristic of a simple diagram of one loop with two external lines, while the coefficients can be obtained from rules analogous to the rules of residue calculus. (Author)

AD-626 093 Fld. 20/10, 12/1
TORINO UNIV (ITALY) ISTITUTO DI FISICA
THE SHORT-WAVELENGTH APPROXIMATION TO THE SCHRODINGER EQUATION,
by L. Bertocchi, S. Fubini, and G. Furlan. 30 Sep 64, 34p. Contract AF-EOAR-39-64
AFOSR 65-1847
Unclassified report

Availability: Published in Il Nuovo Cimento v35 (Ser10) p599-633 1965. Copies to DDC users only.

Descriptors: (*Quantum mechanics, Differential equations), (*Differential equations, Approximation (Mathematics)), Transcendental functions, Integration, Complex variables, Field theory

The short-wavelength approximation to the Schrodinger equation in the presence of one and two turning points is studied. Two methods are presented which allow the evaluation of the higher corrections to the elementary W.K.B. approximation. The first method, the 'real method', employs higher transcendental functions, the second one uses complex integration techniques. (Author)

AD-626 100 Fld. 20/10, 20/8
BELFER GRADUATE SCHOOL OF SCIENCE YESHIVA UNIV NEW YORK
QUANTIZED GRAVITATIONAL THEORY AND INTERNAL SYMMETRIES,
by Arthur Komar. 28 May 65, 5p. Contract AF-AFOSR-816-65 Proj. AF-9767 Task 976704
AFOSR 65-1874
Unclassified report

Physical Review Letters v15 n2 p76-8 Jul 12 1965.

Descriptors: (*Gravity, Quantum mechanics), (*Nuclear structure, Elementary particles), (*Groups (Mathematics), Quantum mechanics), Relativity theory, Field theory

The construction of a general relativistic quantum theory of gravitation is discussed. Considering that the Einstein group is a function group and simple, it is suggested that there exists no unique procedure for constructing such a theory. A truncated classical theory is considered which is obtained by considering only those families of solutions of the Einstein field equations which satisfy boundary conditions at infinity suitable for a discussion of gravitational radiation. From this theory one can recover a preferred group of space-time transformations, the generalized Bondi-Metzner (GBM) group, similar to the Poincare group, though infinite. The GBM group has two Abelian normal subgroups, called T and ST, where T is a 4-dimensional group associated with the translations. It is proposed that the infinite group I =GBM/T is a possible candidate for the internal symmetry group. (Author)

AD-626 297 Fld. 20/10, 20/8
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
CLASSICAL EXAMPLES OF SPACE INVERSION AND TIME REVERSAL,
by L. I. Schiff. 18 Dec 64, 8p. Contract AF49 (638)-1389 Proj. AF-9751 Task 975101
AFOSR 65-1758
Unclassified report

Availability: Published in Physics v1 n4 p209-13 1965. Copies to DDC users only.

Descriptors: (*Invariance, Hamiltonian), (*Electric moments, Dipole moments), (*Dipole moments, Elementary particles), Field theory, Magnetic moments, Time, Motion, Selection rules

The motions of four different classical systems under space inversion (P) and time reversal (T) are discussed. It is imagined that each system is photographed with a motion picture camera, and that the film is developed and positively printed. The film may then be inverted front for back and run through the projector in normal time sequence (P), or run through the projector in the correct orientation but backward in time (T). If the projected image represents a possible motion of the system, we say that it is P or T invariant, as the case may be. Classical models of a moving charge, a precessing magnetic dipole, a moving magnetic monopole, and a precessing electric dipole, are considered. As might be expected, the first two systems turn out to be separately P and T invariant, and the last two are neither P nor T invariant. A brief comment is made on charge conjugation (C) invariance and the classical validity of CPT invariance. (Author)

AD-626 359 Fld. 20/10, 20/8
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
HIGH-ENERGY BEHAVIOR AT FIXED ANGLE FOR THE FIVE-POINT FUNCTION IN PERTURBATION THEORY,
by J. V. Greenman. 28 Sep 64, 13p. Contract AF-EOAR-63-79
AFOSR 65-1866
Unclassified report

Availability: Published in Journal of Mathematical Physics v6 p660-70 Apr 1965. Copies to DDC users only.

Descriptors: (*Perturbation theory, N-body problem), (*N-body problem, Topology), (*Quantum mechanics, Nuclear particles), Center of mass, Combinatorial analysis

The validity of the d-line method used by Halliday in studying the high-energy behavior at fixed angle

of the four-point function is examined in more detail. This is carried out within the context of determining the highenergy behavior at fixed angle for the five-point function.

AD-626 454 Fld. 20/10, 20/8
CALIFORNIA INST OF TECH PASADENA
SYMMETRY VIOLATING TRIAL WAVE FUNCTIONS,
by H. D. Zeh. 28 Aug 65, 13p. Contract Nonr-220 (47) ,AT (04-3)-63
Unclassified report

Availability: Published in Zeitschrift fur Physik, v188 p361-73 1965. Copies to DDC users only.

Descriptors: (*Wave functions, Calculus of variations), (*Hamiltonian, Wave functions), Perturbation theory, Moment of inertia, Hartree-Fock approximation, Quantum mechanics, Nuclear shell models

A variational procedure using trial wave functions projected on to symmetry eigen-states is investigated. In the individual particle model it leads to generalized self-consistent single-particle equations being dependent on the symmetry eigenvalue. A perturbation expansion appropriate for the case of strong symmetry violations is described. Model independent expressions for the moment of inertia and the decoupling parameter are derived by applying the method to rotational symmetry. (Author)

AD-625 682 See Fld. 20/8

AD-625 700 See Fld. 20/8

AD-625 708 See Fld. 9/1

AD-625 989 See Fld. 20/8

AD-626 108 See Fld. 20/8

AD-626 201 See Fld. 20/4

AD-626 330 See Fld. 20/8

AD-626 332 See Fld. 20/8

AD-626 334 See Fld. 20/8

AD-626 336 See Fld. 20/8

AD-626 339 See Fld. 20/8

AD-626 340 See Fld. 20/8

AD-626 341 See Fld. 20/8

AD-626 342 See Fld. 20/8

AD-626 369 See Fld. 20/2

AD-626 484 See Fld. 20/8

AD-626 498 See Fld. 20/8

AD-626 512 See Fld. 20/8

AD-626 513 See Fld. 20/8

20/11. SOLID MECHANICS

AD-625 685 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
STATE UNIV OF NEW YORK BUFFALO DIV OF INTERDISCIPLINARY STUDIES AND RESEARCH
CREEP OF CIRCULAR PLATES WITH TEMPERATURE GRADIENTS.
Summary rept.,
by F. A. Cozzarelli. May 65, 34p. Rept. no. rept. no. ,5
Contract Nonr-449 (00)
Unclassified report

See also AD-625 686.

Descriptors: (*Metal plates, Creep), (*Creep, Metal plates), Bending, Temperature, Loading (Mechanics), Rings, Numerical analysis

An analysis of creep bending in circular plates with temperature gradients is presented in this paper. The analysis is based on a creep power law in which the creep parameter is expressed as a function of temperature. Governing equations are developed for plates subjected to radially symmetric loads and temperatures. Complete moment and deflection solutions are obtained by an iterative technique for simply supported plates subjected to linear radial temperature distributions and uniform lateral loads. (Author)

AD-625 686 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
STATE UNIV OF NEW YORK BUFFALO DIV OF INTERDISCIPLINARY STUDIES AND RESEARCH
EFFECT OF RANDOM TEMPERATURE DISTRIBUTIONS ON CREEP IN CIRCULAR PLATES.
Summary rept.,
by T. T. Soong, and F. A. Cozzarelli. Oct 65, 34p. Rept. no. 7
Contract Nonr-449 (00) Grant ,NSF-GK-17
Unclassified report

See also AD-625 684.

Descriptors: (*Metal plates, Creep), (*Creep, Metal plates), Temperature, Bending, Loading (Mechanics), Rings, Numerical analysis, Moments, Deflection, Statistical distributions

An analysis is presented concerning creep bending of circular plates with a randomly varying temperature distribution. Analytical and numerical results are presented on the statistical properties of the radial moment, circumferential moment, and lateral deflection. It is shown that the radial and tangential moments are relatively insensitive to random variations in the temperature distribution. The statistical distribution of the lateral deflection is derived analytically in a simple and general form. (Author)

AD-625 696 Fld. 20/11, 11/6
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF ENGINEERING MECHANICS
SPHERICAL ELASTO-PLASTIC WAVES IN MATERIALS,
by N. Davids, P. K. Mehta, and O. T. Johnson. 1965, 13p. Contract DA-31-124-ARO (D)-67

AROD 3842:6
Unclassified report

Availability: Published in Behavior of Materials Under Dynamic Loading, The American Society of Mechanical Engineers p125-37 New York, N. Y. Copies to DDC users only.

Descriptors: (*Mechanical waves, Aluminum alloys), (*Aluminum alloys, Mechanical waves), Spheres, Loading (Mechanics), Dynamics, Numerical analysis

The expansion of spherical cavities in impulsively loaded thick metal spheres is investigated, both analytically and experimentally. The method of analysis is one which bypasses formulation in terms of differential equations and associated boundary conditions which, due to their intractable form, would have to be solved by coding for automatic computation. Rather, the computer program is constructed directly from the physical laws and the finite formulation of the material constitutive relations. The results show that spherical plastic waves propagate at the speed of bulk compressional waves as long as discontinuities persist across the boundary. (Author)

AD-625 716 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
AN EXPERIMENTAL STUDY OF THE CREEP BUCKLING OF CIRCULAR CYLINDRICAL SHELLS UNDER AN AXIALLY APPLIED COMPRESSION.
Technical rept.,
by R. Carlson, B. Schneider, and L. Berke. Oct 65, 48p. Rept. no. SUDAER-248 ,TR-16
Contract Nonr-225 (30) ,Nonr-225 (47) Proj. NR-064-425
Unclassified report

Descriptors: (*Cylindrical bodies, Buckling (Mechanics)), (*Structural shells, Buckling (Mechanics)), Compressive properties, Creep, Electroforming, Creep strength, Tests, Taper, Strain (Mechanics), Stresses

The use of electroforming to produce circular cylindrical shells is described. Examples are cited for which the use of electroforming provides opportunities for the development of unique specimen designs and test procedures. The use of a tapered creep specimen to generate isochronous stress-strain curves is described. The procedure developed provides a method for deriving basic creep relationships form data obtained from a small number of tests. The results of creep buckling tests on circular cylindrical shells under axial compression are presented. The basic features described are the end-shortening history, the variation of buckling load with time, and the post-buckling pattern which is developed. (Author)

AD-625 790 Fld. 20/11
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DYNAMIC PROBLEM OF THE THEORY OF ELASTICITY FOR A PLATE FROM TRANSVERSAL ISOTROPIC MATERIAL,
by V. I. Makhovikov. 27 Oct 65, 15p. Rept. no. FTD-TT-65-874
TT 66-60138
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Matematika (USSR) n4 (41) p111-7 1964.

Descriptors: (*Dynamics, Metal plates), (*Metal plates, Dynamics), (*Elasticity, Theory), USSR

AD-625 799 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
APPLIED MECHANICS (SELECTED ARTICLES),
by O. O. Zhuravel, V. I. Borysenko, D. V. Babych, and M. O. Kilchevskyy. 19 Oct 65, 31p. Rept. no. FTD-TT-65-975
TT 66-60146
Unclassified report

Trans. of Prykladna Mekhanika (USSR) v10 n6 p600-7, 632-9, 660-3 1964.

Descriptors: (*Conical bodies, Mechanics), (*Structural shells, Mechanics), Deformation, Stability, Vibration, Impact shock, Fluids, USSR, Mathematical analysis

Contents: Symmetric deformation of a conical shell, stiffened by ribs; Stability of a cylindrical shell under longitudinal impact; Approximate calculation of longitudinalraidal vibrations of a system of cylindrical shells, partially filled with fluid.

AD-625 805 Fld. 20/11
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ASYMPTOTIC SOLUTION OF A PROBLEM ABOUT AXIALLY SYMMETRICAL DEFORMA-

TION OF A CONICAL SHELL OF LINEAR-VARIABLE THICKNESS,
by Yu. S. Korolevich. 17 Dec 65, 17p. Rept. no. FTD-TT-65-1373
TT 66-60149

Unclassified report

Unedited rough draft trans. of Prykladna Mekhanika (USSR) v5 n1 p106-13 1959.

Descriptors: (*Structural shells, Conical bodies), (*Deformation, Structural shells), Approximation (Mathematics), USSR

AD-625 838 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
THE PREFERRED MODE SHAPE IN LINEAR BUCKLING ANALYSIS OF CIRCULAR CYLINDRICAL SHELLS UNDER UNIFORM AXIAL COMPRESSION.
Technical rept.,
by P. Mann-Nachbar, and W. Nachbar. May 64, 48p. Rept. no. LMSC-6-90-63-115

Unclassified report

Descriptors: (*Cylindrical bodies, Buckling (Mechanics)), (*Structural shells, Buckling (Mechanics)), Compressive properties, Statistical analysis, Geometric forms, Manufacturing methods

The chessboard buckle pattern in the solution of the linearized Donnell equations for buckling of a thin, cylindrical shell under axial compression is so sensitive to uncertainties in shell dimensions that the number of circumferential waves and the aspect ratio of the buckles is indeterminate. This problem is treated statistically. Shell dimensions are treated as random variables with probability distributions dependent on nominal values and manufacturing tolerances. Distributions for aspect ratio and number of circumferential waves are found by a Monte-Carlo technique. It is found that the linear theory does contain a mechanism for distinguishing among buckle shapes; there is always a preferred buckle shape. For thin shells and attainable manufacturing tolerances, the aspect ratio of the preferred shape is near one, and the corresponding number of buckles is large. (Author)

AD-626 007 Fld. 20/11, 13/9
CFSTI Prices: HC $2.00 MF $0.50
MECHANICAL TECHNOLOGY INC LATHAM N Y
THERMAL STRESSES IN A CONVECTIVE ELASTIC HALF SPACE ASSOCIATED WITH AN ARBITRARILY DISTRIBUTED FAST-MOVING HEAT SOURCE,
by V. C. Mow, and H. S. Cheng. Dec 65, 27p.
Rept. no. MTI-65TR60
Contract Nonr-3729 (00)

Unclassified report

See also AD-432 339.

Descriptors: (*Thermal stresses, Elasticity), (*Elasticity, Thermal stresses), Lubrication, Roller bearings, Convection (Heat transfer), Numerical analysis, Integral transforms

A solution of the stress field within an elastic half-space under an arbitrarily-distributed, fast moving heat source of constant velocity within two dimensional, quasi-static, uncoupled thermoelastic theory is presented. The surface is allowed to dissipate heat by convention. An example associated with the elastohydrodynamic lubrication is given. (Author)

AD-626 008 Fld. 20/11, 13/9
CFSTI Prices: HC $2.00 MF $0.50
MECHANICAL TECHNOLOGY INC LATHAM N Y
STRESSES IN LUBRICATED ROLLERS CONSIDERING ARBITRARILY DISTRIBUTED NORMAL AND TANGENTIAL LOADS,
by H. S. Cheng, and R. J. Wernick. Dec 65, 28p.
Rept. no. MTI-65TR61
Contract Nonr-3729 (00)

Unclassified report

Descriptors: (*Roller bearings, Stresses), (*Stresses, Roller bearing), Lubrication, Loading (Mechanics), Numerical analysis

A numerical solution to the stresses in lubricated rollers considering arbitrarily distributed normal and tangential loads is obtained. Results are obtained for rollers operating in the elastohydrodynamic regime with and without sliding. The effect of a small amount of slip in the contact is shown to be significant (Author)

AD-626 055 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH APPLIED MATHEMATICS RESEARCH GROUP
CONTACT PROBLEMS IN THE LINEAR THEORY OF VISCOELASTICITY,
by G. A. C. Graham. 10 Sep 65, 47p. Rept. no. PSR-24/7
Contract AF-AFOSR-444-64 Proj. AF-9749
Task 974901
AFOSR 65-1906

Unclassified report

Descriptors: (*Viscoelasticity, Theory), Stresses, Strain (Mechanics), Dynamics, Mathematical analysis

Some well known elastic half space solutions are generalized to encompass arbitrary linear viscoelastic behavior. The viscoelastic material is assumed to be homogeneous and isotropic, and thermal effects are not included. The main part of the survey is devoted to the quasi-static theory whose distinguishing feature is the neglecting of the inertia terms in the equations of motion. Expressions are found for the displacement stress field acting at any point of a viscoelastic half space whose boundary is subjected to an arbitrary time dependent distribution of normal pressure. The solution to the general axisymmetric elastic contact problem given by Sneddon is extended to viscoelasticity theory. Generalizations of the axisymmetric elastic contact problem with friction and Hertz's theory of the contact of smooth elastic bodies are also given. Problems of rolling contact are considered, and some viscoelastic half space problems are solved on the assumption that inertia terms may not be neglected. (Author)

AD-626 127 Fld. 20/11
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
SMALL DEFORMATIONS SUPERPOSED ON LARGE DEFORMATIONS IN MATERIALS WITH FADING MEMORY,
by A. C. Pipkin, and R. S. Rivlin. 15 Jun 61, 12p.
Contract Nonr-562 (10) Grant NSF-G-11567

Unclassified report

Availability: Published in Archive for Rational Mechanics and Analysis v8 n4 p297-308 1961. Copies to DDC users only.

Descriptors: (*Deformation, Materials), (*Materials, Viscoelasticity), Stresses, Strain (Mechanics), Tensor analysis, Tensile properties, Functions

The non-linear stress-deformation relation for materials with memory has been discussed. The restricted form applicable to small dynamic deformations superposed on large statis deformations is derived. Although this can be done by making an appropriate linearization of the final result of the non-linear theory, some of the complexities of that theory are avoided by introducing the linearization at an earlier stage. The results obtained will apply in particular to problems of wave propagation in finitely deformed viscoelastic bodies. When the deformation consists of an infinitesimal displacement field superimposed on a finite deformation, the stress-deformation relation can be linearized with respect to the gradients of the infinitesimal displacement field. In a material with fading memory, if the finite deformation is held fixed long enough so that the original deforming process has no further effect, the non-linear functionals specifying the stress can be expressed in terms of non-linear functions and linear functionals. The functions appearing in the linearized formulation are subject to restrictions in form if the material has any symmetries in its underformed state. In the case of isotropic materials, these restrictions are such that the constitutive equation can be brought into a simpler form involving the classical strain tensor.

AD-626 187 Fld. 20/11, 21/9.2
CFSTI Prices: HC $4.00 MF $0.75
PURDUE UNIV LAFAYETTE IND SCHOOL OF AERONAUTICS ASTRONAUTICS AND ENGINEERING SCIENCES
CONTINUUM THEORY OF NONLINEAR VISCOELASTICITY.
Technical research rept.,
by A. C. Eringen, and R. A. Grot. Oct 65, 101p.
Rept. no. TR-32
Contract Nonr-1100 (23) Proj. NR-064-410

Unclassified report

Presented at the meeting of International Conference on the Mechanics and Chemistry of Solid Propellants, Apr 19-21, 1965, Purdue Univ.

Descriptors: (*Continuum mechanics, Viscoelasticity), (*Viscoelasticity, Continuum mechanics), Nonlinear systems, Theory, Materials, Propellants, Solids, Polymers, Thermal stresses

An assessment of the recent developments in the field of nonlinear continuum mechanics is presented with the view of developing a systematic approach to the formulation of nonlinear theories of viscoelastic materials. Contact is established with various types of approximations useful in the treatment of engineering problems involving solid propellant materials. (Author)

AD-626 214 Fld. 20/11, 9/2
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA
TREATMENT OF RELEASES AND CONSTRAINTS IN THE NETWORK FORMULATION OF STRUCTURAL ANALYSIS.
Technical progress rept. Sep 64-Sep 65 (Structural research series),
by Steven J. Fenves, Samuel P. Mauch, and Ravindar K. Kinra. Oct 65, 79p. Rept. no. SRS-299
Contract Nonr-1834 (03) Proj. NR-064-183
Task 3

Unclassified report

Descriptors: (*Structures, Mechanical properties), (*Stresses, Structures), Networks, Topology, Programming (Computers), Force (Mechanics), Elasticity, Loading (Mechanics), Beams (Structural), Joints

In the hitherto developed network-topological formulation of linear structural analysis each member and each support joint was assumed to provide full fixity in all directions considered, and all distortion components in a member were incorporated in the stiffness or flexibility matrix of the member. In actual structures it is often desirable to prescribe additional conditions on individual force or displacement vector components. The network formulation is extended so that arbitrary specifications of releases and constraints for both members and joints can be incorporated into the general formulation without destroying its simplicity and compactness. As a special case of joint releases, a convenient procedure for the treatment of symmetrical and antisymmetrical structures is described. The theory is developed for both the stiffness and flexibility methods; however, only the implementation of the stiffness formulation has been carried out and is presented herein. (Author)

AD-626 293 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
THE DECAY OF PLANE WAVES IN THE LINEAR THEORY OF VISCOELASTICITY.
Technical rept.,
by George M. C. Fisher. Oct 65, 42p. Rept. no. TR-2
Contract Nonr-562 (40) Proj. NR-064-406
Unclassified report

Descriptors: (*Viscoelasticity, Theory), (*Mechanical waves, Propagation), Continuum mechanics, Shock waves, Mathematical analysis

This paper is the sequel to AD-604 661 in which we have derived a necessary propagation condition governing the wavespeeds with which shocks and all higher order singular surfaces must propagate in a material subject to linear viscoelastic behavior. Of obvious interest is the manner in which the wave front varies with time. This subject, in the case of nonlinear, one-dimensional acceleration waves, has been treated by Coleman and Gurtin. Their work on general materials with memory includes onedimensional linear viscoelastic wave propagation as a special case. They show that when the stressstrain law is non-linear, the strength of an acceleration wave may either grow or decay; but it always decays in the linear theory providing the initial slope of the relaxation function is negative. These same results were established simultaneously by Varley for a slightly less general constitutive assumption (a constitutive equation of integral type), but for more general motions (plane, cylindrical, and spherical waves). Chen has also treated this problem. (Author)

AD-626 294 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
THERMODYNAMICS AND ONE-DIMENSIONAL SHOCK WAVES IN MATERIALS WITH MEMORY.
Technical rept.,
by Bernard D. Coleman, and Morton E. Gurtin. Aug 65, 31p. Rept. no. TR-3
Contract Nonr-562 (40) Proj. NR-064-406
Unclassified report

Descriptors: (*Thermodynamics, Viscoelasticity), (*Viscoelasticity, Thermodynamics), (*Shock waves, Viscoelasticity), Continuum mechanics, Propagation

This paper studies one-dimensional shock waves in materials with have long range non-linear viscoelastic memory but do not conduct heat. In particular it generalizes many aspects of the classical theory of Hugoniot curves. (Author)

AD-626 391 Fld. 20/11, 7/4
WISCONSIN UNIV MADISON DEPT OF CHEMISTRY
VISCOELASTIC PROPERTIES OF GLUCOSE GLASS NEAR ITS TRANSITION TEMPERATURE,
by H. H. Meyer, and John D. Ferry. 1965, 8p.
Contract DA-ARO (D)-31-124-G467
AROD 4129:4
Unclassified report

Availability: Published in Transactions of the Society of Rheology v9 n2 p343-50 1965. Copies to DDC users only.

Descriptors: (*Glucose, Viscoelasticity), Creep, Shear stresses, Supercooling, Viscosity, Frequency, Spectroscopy, Glass

Storage and loss shear moduli of supercooled glucose were measured at thirteen temperatures from 27.4 to 41.1C in the frequency range from 0.3 to 1.8 cps. Shear creep was measured at four temperatures from 41.1 to 47.6C. The temperature dependence of the storage moduli and the creep compliance was described by reducing the time and frequency scales with shift factors calculated from the WLF equation, the constants corresponding to a fractional free volume of 0.026 at 41.1C and a free volume expansion coefficient of 0.00036/deg. The loss moduli plotted against reduced frequency did not give a single composite curve, however. Conversion of the dynamic measurements to creep compliance by approximation methods provided the latter function over ten decades of logarithmic time except for a gap of three decades in the middle of the range. At long times, the creep was indistinguishable from viscous flow; the viscosity at 41.1C was 1.82 X 10 to the 10th power poise. At short times, the limiting creep compliance appeared to be 0.32 X 10 to the -10th power sq. cm/dyne, and there was an additional time-dependent compliance of at least this magnitude with a broad distribution of retardation times. The relaxation and retardation spectra were calculated for this region. (Author)

AD-626 393 Fld. 20/11
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
NOTE ON ERICKSEN'S PROBLEM,
by Manohar Singh, and Allen C. Pipkin. 17 May 65, 3p. Contract DA-ARO (D)-31-124-G484
AROD 1271:46
Unclassified report

Availability: Published in Journal of Applied Mathematics and Physics (ZAMP) v16 Fasc5 p706-9 1965. Copies to DDC users only.

Descriptors: (*Deformation, Elasticity), Surface tension, Strain (Mechanics), Invariance

The existence is proved of a 3-parameter family of inhomogeneous deformations with constant deformation invariants. These deformations are supported in homogeneous, isotropic, incompressible materials by surface traction. (Author)

AD-626 460 Fld. 20/11
CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE
THE INFLUENCE OF COUPLE-STRESSES ON SINGULAR STRESS CONCENTRATIONS IN ELASTIC SOLIDS,
by Rokuro Muki, and Eli Sternberg. 27 Jan 65, 39p. Contract Nonr-220 (58)
Unclassified report

Availability: Published in Journal of Applied Mathematics and Physics v16 n5 p611-48 1965. Copies to DDC users only.

Descriptors: (*Stresses, Strain (Mechanics)), (*Shear stresses, Loading (Mechanics)), Elasticity, Deformation, Continuum mechanics, Surface tension, Boundary value problems

Plane-strain problems for which classical theory predicts singular stress concentrations are discussed. The problems of the half-plane under concentrated edge forces and under a discontinuious distribution of shearing tractions, both of which involve load-induced concentrations of stress, are considered. The geometrically induced stress concentration arising at the corners of a smooth flat-ended punch applied at right angles to the plane boundary of a demi-infinite solid is discussed.

AD-626 591 Fld. 20/11
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROELASTIC AND STRUCTURES RESEARCH LAB
THEORETICAL-EXPERIMENTAL CORRELATION OF LARGE DYNAMIC AND PERMANENT DEFORMATIONS OF IMPULSIVELY-LOADED UNBONDED CONCENTRIC RINGS.
Final rept.,
by Hans A. Balmer, and Emmett A. Witmer. Nov 65, 82p. Rept. no. ASRL-TR-128-4
Contract AF33 (615)-1943 Proj. AF-6906 Task 690601
AFFDL TR-65-143
Unclassified report

Descriptors: (*Rings, Deformation), Loading (Mechanics), Numerical analysis, Dynamics, Impact shock, Correlation techniques, Stresses, Strain (Mechanics), Tests

A numerical method previously described for predicting large dynamic and permanent deformations of twodimensional structures of elastic-plastic material was extended to analyze explosively-loaded unbonded concentric rings. This extension was employed to carry out comparisons between predicted and measured dynamic responses and permanent deformations of explosivelyloaded unbonded concentric 6061-T6 rings. Good agreement between theory and experiment was found. (Author)

AD-626 611 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C STRUCTURAL MECHANICS LAB
ELASTIC INSTABILITY OF PROLATE SPHEROIDAL SHELLS UNDER UNIFORM EXTERNAL PRESSURE.
Research and development rept.,
by Barry I. Hyman. Dec 65, 40p. Proj. BuShips S-R011-01-01 Task 0401
DTMB 2105
Unclassified report

Descriptors: (*Structural shells, Buckling (Mechanics)), Elasticity, Stability, Pressure, Potential energy, Mathematical analysis, Equations, Transformations (Mathematics), Graphics

The Rayleigh-Ritz method is used to obtain the governing equations for the buckling and post-buckling behavior of prolate spheroidal shells. The buckling displacements are assumed to be confined to a shallow cap, and a coordinate transformation is employed to simplify the integration of the energy expression. Graphical results are presented for several cases that demonstrate the effect of varying the eccentricity of the generating ellipse of the shell. (Author) Paper presented at the 9th Midwestern Mechanics Conference, Madison, Wis., Aug. 15-18, 1965.)

AD-626 634 Fld. 20/11
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB WHITE OAK MD
STRESS WAVE PROPAGATION IN A STRAIN-RATE SENSITIVE MATERIAL,
by James L. Rand, Jackson C. S. Yang, and John M. Marshall. 12 Apr 65, 32p. Rept. no. NOLTR-65-11 ,Ballistic Research-143
Unclassified report

Descriptors: (*Stresses, Mechanical waves), (*Materials, Deformation), (*Strain (Mechanics), Materials), Plasticity, Elasticity, One-dimensional flow

The purpose of this study is to examine the existing theories for material response, utilizing the dynamic stress-strain properties of 'rate sensitive' materials. All the predictions made from the theories were verified experimentally. An air gun was used to impact small Lexan cylinders against a high strength target. The deformation, as well as the propagation of the stress wave resulting from the impact was measured and are within 8.5% of the predicted results. (Author)

AD-625 816 See Fld. 1/3

AD-625 912 See Fld. 11/6

AD-626 154 See Fld. 11/9

AD-626 208 See Fld. 11/10

AD-626 226 See Fld. 13/13

AD-626 239 See Fld. 11/6

AD-626 304 See Fld. 22/2

AD-626 374 See Fld. 11/6

AD-626 376 See Fld. 13/8

AD-626 412 See Fld. 9/2

AD-626 580 See Fld. 11/2

AD-626 583 See Fld. 13/8

AD-626 599 See Fld. 13/8

20/12. SOLID STATE PHYSICS

AD-625 687 Fld. 20/12, 7/4
CFSTI Prices: HC $1.00 MF $0.50
CORNELL UNIV ITHACA NY LAB OF ATOMIC AND SOLID STATE PHYSICS
ELECTRON-NUCLEUS MAGNETIC INTERACTIONS IN CS METAL.
Technical rept.,
by D. F. Holcomb, J. A. Kaeck, and J. H. Strange.
Dec 65, 17p. Rept. no. TR-1
Contract Nonr-401 (54)

Unclassified report

Descriptors: (*Nuclear magnetic resonance, Electrons), (*Cesium, Nuclear magnetic resonance), Nuclear spins, Crystal lattices, Relaxation time, Diffusion, Hyperfine structure

The characteristic nuclear magnetic resonance parameters, Knight shift, line shape and width, and relaxation times, were measured in cesium metal from the melting point to 1.4K. The nuclear spin relaxation time, S, is inversely proportional to the temperature from 300K to 7K, with ST = 0.13 = 0.01 sec-deg. K. For temperatures below 7K, the relaxation shows another contribution. The Knight shift increases linearly with temperature down to 4K, following the line previously measured by Gutowsky and McGarvey at higher temperatures. Diffusion narrowing of the magnetic resonance line is observed at 190K, but the strong electron-nuclear interactions preclude good diffusion constant measurements. (Author)

AD-625 705 Fld. 20/12
MILAN UNIV (ITALY) ISTITUTO DI FISICA
EVIDENCE FOR SPACE CHARGE POLARIZATION IN PURE KCL AT LOW TEMPERATURES.
Revised ed.,
by C. A. Bucci, and S. C. Riva. 31 Jul 64, 10p.
Contract AF-EOAR-27-63 Proj. AF-9761
Task 976103
AFOSR 65-1893

Unclassified report

Revision of manuscript submitted 19 Mar 64. Previously presented to the Symposium of the Italian Physical Society (S.I.F.) (49th), Bari, November 1963.

Availability: Published in The Journal of Physics and Chemistry of Solids, v26 p363-71 1965.

Descriptors: (*Potassium compounds, Chlorides), (*Space charges, Potassium compounds), (*Crystals, Space charges), Polarization, Dielectric properties, Relaxation time, Thermal conductivity, Ionic current, Electrostatic fields, Italy

A study was carried out on the polarization effects in KCl crystals of different purity in the range of temperatures between LNT and 250C. It is shown that the effects of dielectric relaxation of dipolar nature are present together with non-linear polarization phenomena. The presence of the latter was studied by means of a careful testing of Ohm's law, of the superposition principle and by means of the method of ionic thermoconductivity (ITC.). The ITC. method allows a qualitative and quantitative discrimination of the different polarization processes. The results show that part of the current decay, observed when the static electric field is applied to a KCl single crystal, is due to dipolar orientation, but part of it cannot be imputed to linear dielectric relaxation; an interpretation in terms of ionic space charge formation is shown to be more realistic. (Author)

AD-625 711 Fld. 20/12
ILLINOIS UNIV URBANA DEPT OF PHYSICS
SUPERCONDUCTING PROPERTIES OF TIN, INDIUM, AND MERCURY BELOW 1 K,
by D. K. Finnemore, and D. E. Mapother. 3 May 65, 12p. Contract DA-31-124-ARO (D)-359
AROD 2771:10

Unclassified report

Availability: Published in The Physical Review v140 n2A pA507-18 Oct 18 1965. Copies to DDC users only.

Descriptors: (*Tin, Superconductivity), (*Indium, Superconductivity), (*Mercury, Superconductivity), Cryogenics, Entropy, Specific heat

The superconducting critical field curves for pure Sn, In, and Hg have been measured down to about 0.3K. In the low-temperature region where the superconducting electronic entropy is negligible, the entropy difference (and hence the normal electronic entropy) is linear in temperature, as expected for a free electron gas. The measurements provide a sensitive test for details of the BCS theory in that the accuracy obtainable is much higher than in other experiments. A simple scaling of the energy-gap-to-temperature ratio brings the theoretical predictions into good agreement with experiment. The results are critically analyzed in the light of a possible lattice contribution to the entropy change at the superconducting transition of In, but no evidence for such a lattice contribution is found. (Author)

AD-625 757 Fld. 20/12, 20/3
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
STRONG-FIELD GALVANOMAGNETIC EFFECTS IN N-TYPE GERMANIUM,
by L. J. Neuringer. 1964, 9p. Contract AF19 (604)-7344 Proj. AF-9764
AFOSR 65-1763

Unclassified report

Availability: Published in Intern. Conf. Phys. Semicond. (7th), Paris, France p379-85 Jul 19-24 1964. Copies to DDC users only.

Descriptors: (*Germanium, Magnetic fields), (*Resistance (Electrical), Magnetic fields), (*Conductivity, Mobility), Crystal lattices, Scattering, Relaxation time, Anisotropy, Hall effect, Impurities, Carriers (Semiconductors)

A quantitative analysis is made of the dependence of the longitudinal saturation magnetoresistance upon the strength of the impurity scattering in n-type germanium at 77K. Measurements of the longitudinal magnetoresistance and Hall coefficient are performed as a function of magnetic field to 130 kg, and the conductivity mobility is determined by the mixed lattice and impurity scattering. The classical strong-field theory of Herring and Vogt and the Born approximation are found to be in agreement with experimental results. The overall relaxation time anisotropy is found to be greater than unity for all samples studied and is 1.23 in the case of pure lattice scattering. The conductivity mobility for pure lattice scattering is given a value of 41,000 sq-cm/V-sec. (Author)

AD-625 774 Fld. 20/12, 20/3
MARYLAND UNIV COLLEGE PARK
POSSIBILITY OF LONG-RANGE SPIN POLARIZATION IN A DEGENERATE ELECTRON GAS,
by A. Bardasis, D. S. Falk, R. A. Ferrell, M. S. Fullenbaum, and R. E. Prange. 22 Jan 65, 5p.
Contract AF-AFOSR-62-46 Proj. AF-9761
Task 976101
AFOSR 65-1760

Unclassified report

Availability: Published in Physical Review Letters v14 n9 p298-300 Mar 1 1965. Copies to DDC users only.

Descriptors: (*Electrons, Spin), (*Metals, Atomic energy levels), Polarization, Perturbation theory, Electron spin resonance, Ferromagnetism, Nuclear spins

A conclusion of Dreyfus, et al that it is possible for an induced long-range spin-density distribution to exist in a nonferromagnetic metal is investigated as it contradicts the Ruderman-Kittel theory that the spin density generated at large distances from a localized spin perturbation is of an oscillatory nature. The two are reconciled by considering the spin density contributed by the nonevanescing waves. It is concluded that the nonevanescing waves contributes a long-range polarization which just cancels that coming from the evanescing waves, thereby leaving only the expected Ruderman-Kittel spatial dependence. (Author)

AD-625 875 Fld. 20/12
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES
CATHODOLUMINESCENCE AT P-N JUNCTIONS IN GAAS.
by David B. Wittry, and David F. Kyser. 5 Oct 64, 5p. Contract AF-AFOSR-76-63 Proj. AF-9761 Task 976103
AFOSR 65-1898

Unclassified report

Availability: Published in Journal of Applied Physics v36 n4 p1387-9 Apr1965. Copies to DDC users only.

Descriptors: (*Luminescence, Gallium alloys), (*Gallium alloys, Arsenic alloys), Carriers (Semiconductors), Transport properties, Electrons, Semiconductors, Infrared radiation

A decrease in the cathodoluminescence produced in GaAs by a scanning electron probe has been observed when the probe is close to a p-n junction. The decreased intensity is shown to result from the drift of excess carriers across the junction. Measurements of the shortcircuit current of the diode confirm this interpretation and provide a means of estimating minority carrier diffusion lengths. (Author)

AD-626 019 Fld. 20/12, 7/4
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
PARAMAGNETIC RESONANCE ABSORPTION BY DIVALENT VANADIUM ION IN CADMIUM DICHLORIDE.
Technical rept.,
by I. Y. Chan, D. C. Doetschman, Clyde A. HutchisonJr, Bryan E. Kohler, and J. W. Stout.
30 Sep 64, 4p. Rept. no. TR-16
Contract Nonr-2121 (13)

Unclassified report

Availability: Published in Journal of Chemical Physics v42 n3 p1048-50 1 Feb 1965. Copies to DDC users only.

Descriptors: (*Single crystals, Impurities), (*Cadmium compounds, Chlorides), (*Vanadium, Paramagnetic resonance), Absorption spectrum, Hamiltonian, Cryogenics, Ions

AD-626 043 Fld. 20/12, 7/4, 8/12, 20/3
NATIONAL RESEARCH COUNCIL OF CANADE OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY

DIELECTRIC PROPERTIES OF ICES II, III, V AND VI,
by G. J. Wilson, R. K. Chan, D. W. Davidson, and E. Whalley. 28 Apr 65, 9p.
NRC 8654

Unclassified report

Availability: Published in The Journal of Chemical Physics, v43 n7 p2384-91 1 Oct 65. Copies to DDC users only.

Descriptors: (*Ice, Dielectric properties), (*Dielectric properties, Ice), Phase studies, Crystal lattice defects, Stresses, Hydrostatic pressure, Relaxation time, Thermodynamics, Statics, Canada

The dielectric properties of Ices II, III, V, and VI were measured up to 300 kc/sec over a range of temperatures and pressures. All except Ice II exhibited well-defined dielectric dispersion and so are orientationally disordered under the experimental conditions. The dispersion loci were slightly broader than Debye curves, which may reflect the presence of nonequivalent crystal sites. As for Ice I, the static dielectric constants correspond to values of about 3 for the Kirkwood orientational correlation factor. This suggests that these forms of ice are four coordinated, in agreement with infrared and (for Ice III) x-ray evidence at low temperatures. The relaxation rates are considerably faster than for Ice I, and the activation energies and entropies somewhat lower. The volumes of activation are all about 4.6 cucm/mole. The relaxation mechanism appears to be similar to that in Ice I, i.e., relaxation occurs by diffusion of orientational defects. X-ray and infrared studies have indicated that Ice II is rotationally ordered near liquidnitrogen temperature. The absence of orientational polarization in Ice II at temperatures as high as -30C shows it to be ordered throughout its region of stability. (Author)

AD-626 080 Fld. 20/12, 9/1
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
EFFECT OF STRESS ON THE EXCESS AND HUMP CURRENT IN SB-DOPED GERMANIUM DIODES.
by S. Fujita, H. Fritzsche, and J. J. Tiemann. 21 Apr 65, 8p. Contract AF-AFOSR-148-63 Proj. AF-9763 Task 976302
AFOSR 65-1901

Unclassified report

Availability: Published in Journal of the Physical Society of Japan. v20 n8 p1443-7 Aug 1965. Copies to DDC users only.

Descriptors: (*Diodes (Semiconductor), Electric currents), (*Stresses, Diodes (Semiconductor)), (*Tunneling (Electronics), Electric currents), Compressive properties, Electrical properties, Hydrostatic pressure, Germanium, Tunnel diodes, Antimony, Impurities, Cryogenics, Band theory of solids

The effects of uniaxial compression and of hydrostatic pressure on the excess and hump current in germanium tunnel diodes were studied experimentally at 4.2K. The diodes were formed by alloying indium doped with 3/8% gallium on (100) and (110) faces of germanium bars containing an antimony concentration of 5 x 10 to the 18th power/cc. The first order change of the current with stress was measured at fixed forward bias voltages. The experiments show that the excess current involves tunneling from the conduction band valleys to gap states on the p-type side of the junction. A large negative stressinduced current change is associated with a current component which is sometimes observed as a hump in the I-V characteristic between 0.5 and 0.65 v bias. A sharp increase of the pressure coefficient marks the onset of the ordinary injection current at 0.74 v. The effect of shear stress on the injection current was found to be zero to first order in the stress. (Author)

AD-626 081 Fld. 20/12
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
STRESS EFFECTS ON IMPURITY-INDUCED TUNNELING IN GERMANIUM,
by H. Fritzsche, and J. J. Tiemann. 10 Mar 65, 6p. Contract AF-AFOSR-148-63 Proj. AF-9763 Task 976302
AFOSR 65-1902

Unclassified report

Availability: Published in The Physical Review v139 n3A pA920-3 Aug 1965. Copies to DDC users only.

Descriptors: (*Tunneling (Electronics), Germanium), (*Stresses, Tunneling (Electronics)), (*Impurities, Stresses), Compressive properties, Electrical properties, Hydrostatic pressure, Arsenic, Cryogenics, Band theory of solids

The effects of uniaxial compression and of hydrostatic pressure on the impurity induced interband have been studied experimentally at 4.2K. The diodes were formed on (100) and (110) faces of arsenic-doped germanium bars. The stress coefficients of the tunnel current were measured at fixed forward and reverse bias voltages. The experiments show that the part of the electron wave function responsible for impurity-induced tunneling is not associated with a particular conduction-band valley. Some structure in the bias dependence of the shear stress coefficients near zero bias remains unexplained. This structure does not appear in the hydrostatic-pressure coefficient. (Author)

AD-626 082 Fld. 20/12, 20/6, 20/3
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
HIGH-SENSITIVITY PIEZOREFLECTIVITY.
by W. E. Engeler, H. Fritzsche, M. Garfinkel, and J. J. Tiemann. 18 May 65, 6p. Contract AF-AFOSR-148-63 Proj. AF-9763 Task 976302
AFOSR 65-1900

Unclassified report

Availability: Published in Physical Review Letters v14 n26 p1069-72 Jun 28 1965. Copies to DDC users only.

Descriptors: (*Reflectivity, Piezoelectric effect), (*Piezoelectric effect, Electrooptics), (*Band theory of solids, Electrooptics), Semiconductors, Brillouin zones, Stresses, Strain (Mechanics)

A high-sensitivity piezoreflectance technique is described which promises to be useful in the study of the energy band structure of solids. This technique utilizes oscillatory applied strain and synchronous detection at a frequency that is high in comparison with fluctuations in the photodetectors and other sources of instability. The resulting improvement in stability allows measurements to be made of relative reflectivity changes as small as 0.000005. Results of measurements are presented for Ge, Si, and Cu. The experimental data can be used to determine interband transition energies and deformation potentials, and can provide information about the location of the transitions in the Brillouin zone. (Author)

AD-626 131 Fld. 20/12
SOCIETE FRANCAISE DE PHYSIQUE PARIS
INTERNATIONAL CONFERENCE ON THE PHYSICS OF SEMICONDUCTORS (7TH). PROCEEDINGS, PARIS, JULY 19-24, 1964,
by Michel Hulin. 1964, 1269p. Contract AF-EOAR-26-64 Proj. AF-9763 Task 976302
AFOSR 65-0722

Unclassified report

Availability: Dunod, Editeur, 92 Rue Bonaparte, Paris 6, France, 145Francs.

Descriptors: (*Semiconductors, Physics), Band theory of solids, Optical properties, Carriers (Semiconductors), Magneto-optic effect, Transport properties, Electrons, Piezoelectric effect, Impurities, Photoconductivity, Photons, Phonons, France

Contents: Band theory and band structure; Optical properties below and above the absorption edge; Magneto-optical effects; Transport properties of hot electrons; Piezoresistance effects; Transport properties in junction; Piezoelectricity and acousto-electric effect; Quantum and size effects; Lattice transport properties; Impurities in semiconductors; Free excitons; Photoconductivity; Photon-phonon interactions; Semiconducting materials.

AD-626 133 Fld. 20/12, 18/8
SOCIETE FRANCAISE DE PHYSIQUE PARIS
INTERNATIONAL CONFERENCE ON THE PHYSICS OF SEMICONDUCTORS (7TH). 3. RADIATION DAMAGE IN SEMICONDUCTORS.
1964, 313p. Contract AF-EOAR-26-64 Proj. AF-9763 Task 976302
AFOSR 65-0724

Unclassified report

Symposium held at Paris-Royaumont, Jul 64.

Availability: Dunod, Editeur, 92 Rue Bonaparte, Paris 6, France.

Descriptors: (*Semiconductors, Radiation damage), (*Radiation damage, Semiconductors), Crystal lattice defects, Impurities, Annealing, France

Approximately one hundred ten scientists were present at the three day symposium on Radiation damage in semiconductors. The reviews, discussions and contributions presented at the meetings are classified under the following headings: primary structure on defects, defectimpurity interactions, mobility and annealing, theory of point defects, semiconducting compounds, and thresholds and cross sections. The present volume gives a measure of the progress made since the last prior meeting on the subject of radiation effects in semiconductors (1959). (Author)

AD-626 134 Fld. 20/12, 20/5
SOCIETE FRANCAISE DE PHYSIQUE PARIS
INTERNATIONAL CONFERENCE ON THE PHYSICS OF SEMICONDUCTORS (7TH). 4. RADIATIVE RECOMBINATION IN SEMICONDUCTORS.
1964, 291p. Contract AF-EOAR-26-64 Proj. AF-9763 Task 976302
AFOSR 65-0725

Unclassified report

Symposium held at Paris, 27-28 Jul 64.

Availability: Dunod, Editeur, 92 Rue Bonaparte, Paris 6, France.

Descriptors: (*Semiconductors, Lasers), (*Lasers, Semiconductors), Impurities, Electron beams, Excitation, Photoconductivity, France

The symposium on Radiative recombination in semiconductors brought together about two hundred and fifty specialized physicists from some twenty countries. The proceedings give an up-to-date account of the physical processes which are fundamental in semiconductor lasers. The subjects treated include intrinsic radiative recombination, impurity and exciton effects, junction lasers, new excitation processes, in particular those involving an electron beam, and new materials which enlarge the field of semiconductor lasers toward the visible spectrum. (Author)

AD-626 288 Fld. 20/12, 13/8
DEVICE DEVELOPMENT CORP WALTHAM MASS
OPTICAL-CONTACT BONDING,
by H. I. Smith. 19 Feb 65, 7p. Rept. no. Scientific-1
Contract AF19 (628)-3237 Proj. AF-4600 ,AF-0000 Task 460003 ,000029
AFCRL 65-785

Unclassified report

Availability: Publishehed in The Jj Journal of Acoustical Society of America v37 n5 p928-9 May 1965. Copies to DDC users only.

Descriptors: (*Bonding, Quartz), (*Quartz, Bonding), (*Adhesion, Surfaces), Precision finishing, Ultrasonic radiation, Force (Mechanics), Bonded joints, Rods, Surface properties, Surface tension

An optical-contact bond between X-cut quartz rods reflects about 1% of the incident power for ultrasonic waves of 3 and 9 Gc/sec. The physical origin of the optical-contact adhesion force is discussed along with bond-thickness estimates. Techniques for making such bonds are described. (Author)

AD-626 289 Fld. 20/12, 13/8
DEVICE DEVELOPMENT CORP WALTHAM MASS
ADHESION OF POLISHED QUARTZ CRYSTALS UNDER ULTRAHIGH VACUUM,
by H. I. Smith, and M. S. Gussenhoven. 18 Dec 64, 8p. Rept. no. Scientific-2
Contract AF19 (628)3237 Proj. AF-4600 ,AF-0000 Task 460003 ,000029
AFCRL 65-786

Unclassified report

Availability: Published in Journal of Applied Physics v36 n7 p2326-7 Jul 1965. Copies to DDC users only.

Descriptors: (*Bonding, Quartz), (*Quartz, Bonding), (*Adhesion, Surfaces), Single crystals, Vacuum, Precision finishing, Surface properties, Force (Mechanics), Theory, Surface tension, Bonded joints

It was observed that optically polished surfaces of single-crystal quartz adhere readily when contacted under ultrahigh vacuum. This result demonstrates that the widely held theory which attributes optical surface adhesion to surface tension of a liquid film is not complete. Adhesion mechanisms are discussed, and it is postulated that London dispersion forces are responsible for the observed effect. (Author)

AD-626 353 Fld. 20/12, 20/3
MILAN UNIV (ITALY) ISTITUTO DI FISICA
RILASSAMENTI IONICI SUPERFICIALI IN POLVERI DI ALOGENURI ALCALINI (IONIC SURFACE RELAXATION IN POWDERS OF ALKALI HALIDES),
by C. Bucci. 1964, 7p. Contract AF-EOAR-27-63 Proj. AF-9761 Task 976103
AFOSR 65-1784

Unclassified report

Availability: Published in Proc. Ann. Meeting of AEI (65th), Palermo n87 p1-5 1964. Copies to DDC users only.

Descriptors: (*Alkali metal compounds, Dielectric properties), (*Halides, Dielectric properties), (*Potassium compounds, Chlorides), Powders, Surface properties, Ionization, Impurities, Strontium compounds, Thermoelectric properties, Heat of activation, Italy

An experimental investigation of the dielectric surface relaxation in the alkali halides is presented. A study is made of powdered KC1, both pure and contaminated with SrC12, ionized with the aid of thermocurrents in the temperature range between LNT and 250C. The thermocurrent bands at 210K and 460K were attributed to Maxwell Wagner relaxation. In particular, from the 210K band one deduces an activation energy of 0.35 ev and a frequency factor of 10 to the 8th power; these values may correspond to free surface motion. The activation energy values and the frequency factor for the 460K band are in agreement with the typical value of free motion in larger volumes. (Author)

AD-626 361 Fld. 20/12, 20/3, 20/6
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
SOME DIELECTRIC AND ELECTRO-OPTIC PROPERTIES OF BATIO3 SINGLE CRYSTALS,
by C. J. Johnson. 17 Sep 65, 3p. Contract DA-36-039-AMC-03200 Grant ,NSF-GP-2495

Unclassified report

Availability: Published in Applied Physics Letters, v7 n8 p221-3 15 Oct 1965. Copies to DDC users only.

Descriptors: (*Single crystals, Titanates), (*Titanates, Physical properties), (*Barium compounds, Titanates), Dielectric properties, Electrooptics, Magnetic properties

A study was made of the Curie temperature, static dielectric constant, and electro-optic coefficient of barium titanate single cyrstals. The results indicate that the Curie temperature is not a fixed material property, but shows some dependence on the sample history and environment. The static dielectric values show that Curie-Weiss behavior does exist, and the constants C and To were found to be 150000C (=10000C) and 115C (=1C) respectively. The value obtained for the electro-optic coefficient was G11-G12 = 0.10 (meters to the 4th power)/ (sq Coulombs) (=0.02).

AD-626 363 Fld. 20/12
DURHAM UNIV (ENGLAND) DEPT OF PHYSICS
THE FERMI MOMENTA OF SOME FACE CENTRED CUBIC RARE EARTH COMPOUNDS,
by M. I. Darby, and K. N. R. Taylor. 6 Jan 65, 4p. Contract AF-EOAR-75-63 Proj. AF-9763 Task 976302
AFOSR 65-1896

Unclassified report

Availability: Published in Physics Letters, v14 n3 p17980 1 Feb 1965. Copies to DDC users only.

Descriptors: (*Rare earth compounds, Momentum), Gadolinium compounds, Terbium compounds, Dysprosium compounds, Holmium compounds, Thulium compounds, Ytterbium compounds, Nitrides, Phosphides, Arsenic alloys, Antimony alloys, Bismuth alloys, Crystal lattices, Paramagnetism, Great Britain

Using the indirect exchange theory of Ruderman, Kittel (Phys. Rev., 96: 99, 1954) and Yosida (Phys Rev. 106: 893, 1957), the Fermi momenta are determined for Re. X compounds where Re is Gd, Tb, Dy, Ho, Tm, or Yb and X is N, P, As, Sb, or Bi. The Fermi momenta are plotted against lattice spacing. The equation of the resulting straight line suggests that if the effective number of valence electrons per rare earth ion is taken to be 1.42 for all compounds, then the values of the fermi momenta and consequent widely differing paramagnetic Curie points of these compounds can be accounted for entirely by differences in lattice spacings. It is concluded that the use of the indirect exchange theory enables the paramagnetic Curie temperatures of these compounds to be correlated with lattice spacings via their fermi momenta values.

AD-626 411 Fld. 20/12
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB CORONA CALIF
EMITTANCE STUDIES OF III-V COMPOUND SEMICONDUCTORS.
Research rept.,
by D. L. Stierwalt, and R. F. Potter. 9 Nov 65, 32p. Rept. no. NOLC-630
Task R360-FR-104/211-1/R001-01-01,NASA-W-11-400-B

Unclassified report

Descriptors: (*Semiconductors, Emissivity), (*Thermal radiation, Semiconductors), Spectroscopy, Absorption spectrum, Reflection, Blackbody radiation, Phonons, Crystal lattices, Brillouin zones, Optical properties, Indium alloys, Aluminum alloys, Gallium alloys, Phosphorus alloys, Antimony alloys, Arsenic alloys

The report presents a brief discussion of thermal emission and absorption processes, including Planck's radiation function; Kirchhoff's law, which equates the emittance with the absorptance of a sample; and the interrelationships between the emittance, and the transmittance of a sample. Expressions are given for the emittance in three situations: (1) an almost transparent sample; (2) a completely opaque sample; and (3) intermediate situations. Experimental results include direct emittance studies on the III-V compound semiconductors, InP, AlSb, GaAs, GaSb, InAs, InSb, GaP, and AlAs. In addition, certain of the results have been reduced to the intrinsic optical property, the absorption coefficient. In the discussion of results, particular emphasis is given to the fundamental lattice absorption region, known as the reststrahlen frequency, and to multiple-phonon processes. These latter processes result in characteristic absorption spectra, whose features are assigned to certain critical points in the Brillouin zone. As a result, reliable estimates of the phonon dispersion for certain symmetry directions can be made. (Author)

AD-626 443 Fld. 20/12, 13/8
CFSTI Prices: HC $2.00 MF $0.50
MALLORY (P R) AND CO INC BURLINGTON MASS LAB FOR PHYSICAL SCIENCE
INVESTIGATION OF ULTRA HIGH VACUUM SPUTTERED THIN FILMS.
Final rept., 1 Nov 63-31 Oct 65,
by George Wallis, Sumner P. Wolsky, and Ernest E. Pittelli. 30 Nov 65, 47p. Contract AF19 (628)-3840 Proj. AF-4608 Task 460805
AFCRL 65-891

Unclassified report

Descriptors: (*Semiconductors, Films), (*Germanium, Metal films), (*Sputtering, Metal films), (*Silicon, Metal films), Electrical properties, Structural properties, Vacuum apparatus, Epitaxial growth, Semiconducting films, Thin films (Storage devices), Silicon, Substrates, Quartz, Single crystals, Sapphires

The structural and electrical characteristics of low pressure sputtered germanium films deposited on amorphous and single crystal substrates were investigated. The very low deposition rates of the experiments provided an opportunity to examine film growth as a function of the important parameters which influence it. The results of the investigation on amorphous quartz substrates have been presented in the paper entitled 'Low Pressure Sputtered Germanium Films'- J. Vac. Sci. and Tech. 2, 97 (1965). he most recent work concerned with insulating single crystal substrates is presented in the report. Preliminary investigations were made of the structural and electrical characteristics of silicon films sputtered under similar conditions as those used for germanium. The major factor of interest uncovered in this limited investigation concerned the apparently greater mobility of the deposited silicon atom on self substrates as compared to sapphire substrates. (Author)

AD-626 508 Fld. 20/12
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
PHONON ENERGIES IN GERMANIUM FROM PHONON-ASSISTED TUNNELING.
Doctoral thesis,

by R. T. Payne. 18 Feb 65, 15p. Contract AF-AFOSR-148-63 Proj. AF-9763 Task 976302 AFOSR 65-1899

Unclassified report

Availability: Published in The Physical Review v139 n2A pA570-82 19 Jul 1965. Copies to DDC users only.

Descriptors: (*Semiconductors, Tunneling (Electronics)), (*Tunneling (Electronics), Semiconductors), (*Phonons, Tunneling (Electronics)), (*Germanium, Semiconductors), Solid state physics

The line shapes of the peaks in the bias dependence of the second derivative of the phonon-assisted tunnel current with respect to voltage are reported for Sb-doped germanium tunnel junctions between 4.2 and 1.15K. The antimony concentration is 5 x 10 to the 18th power/cc. The phonon energies at the point L in the Brillouin zone, determined to an accuracy of = 0.1%, are E (TA) = 7.766, E (LA) = 27.58, E (LO) = 30.62, and E (TO) = 36.15 in mev. This accuracy verifies the assumptions made in determining the pressure dependence of these phonon energies previously reported by the author. The major contribution to the line shapes is kT broadening. Minor contributions arise from a small bias dependence of the tunnel current per energy interval and from the phonon dispersion near L. Approximate values for the curvatures of the phonon spectrum at L are determined. A lower limit of 1.6 x 10 to the minus 11th power sec is found for the lifetimes of these phonons. From double phonon emission processes the energy of the optic phonon at gamma is found to be 37.3 = 0.2 mev. (Author)

AD-626 530 Fld. 20/12, 20/2
CFSTI Prices: HC $3.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 1, 1 Jan-31 Mar 62,
by Lebo R. Shiozawa, J. L. Barrett, G. P. Chotkevys, S. S. Devlin, and J. M. Jost. 23 Apr 62, 51p. Contract AF33 (657)-7399

Unclassified report

See also AD-626 532.

Descriptors: (*Semiconductors, Solid state physics), Purification, Crystal growth, Cadmium compounds, Sulfides, Selenium alloys, Cadmium alloys, Zinc alloys, Tellurium alloys, Intermetallic compounds, Zone melting, Vapor pressure, Diffusion, Electrical properties, Crystal growth

First quarter progress on the purification, crystal growth, and properties of CdS, CdSe, and ZnTe are summarized. Difficulties were encountered when zone refining of CdSe was attempted. The advantages of using shaped tubes for vapor-phase growth of crystals are described. The vapor pressure of CdSe is discussed and compared with experimental data. The diffusion of Cd in CdSe was analyzed by conductivity measurements; and the data are shown to agree closely with simple diffusion theory. A diffusion constant of 5.41 x 10-1 to the minus 10th power sq cm/sec is obtained for a crystal temperature of 1000C. The temperature dependence of the carrier mobility shows that the dominant lattice scattering in CdSe and ZnTe is due to optical modes as in CdS. The mobility of the carriers in n-type CdSe and p-type ZnTe is 5300 sq cm/volt sec and 2550 sq cm/volt sec respectively at 79K in the particular crystals measured. (Author)

AD-626 532 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 2, 1 Apr-30 Jun 62,
by Lebo R. Shiozawa, J. M. Jost, S. S. Devlin, G. P. Chotkevys, and J. L. Barrett. 1 Aug 62, 33p. Contract AF33 (657)-7399

Unclassified report

See also AD-626 530.

Descriptors: (*Semiconductors, Solid state physics), Cadmium alloys, Selenium alloys, Phase studies, Cadmium compounds, Sulfides, Zinc alloys, Tellurium alloys, Vapor pressure, Diffusion, Thermal expansion, Electrical properties, Sound transmission, Optical properties, Colors, Heat of sublimation, Entropy, Heat of activation, Elasticity, Intermetallic compounds, Crystal growth

Efforts in the Second Quarter continue to emphasize phase equilibria in the system Cd:Se. The vapor pressure of CdSe determined by a free sublimation method in the temperature range 972 to 1247C yielded a standard heat and entropy of sublimation of 87 kcal/mole and 53 cal/ mole/K respectively. The temperature-pressure projection of the Se-rich portion of the Cd:Se phase diagram was approximately defined. New diffusion measurements at 1052 and 1100C give an activation energy for diffusion of Cd donors in CdSe of 88 kcal/mole, and a pre-exponential term of 900,000 sq cm /sec. Thermal expansion coefficients for ZnTe, CdSe, and CdSe were determined in the range 0 - 300C. A complete set of elastic, piezoelectric, and dielectric constants of ZnSe were obtained and are found to be intermediate in value between those of ZnS and ZnTe. The velocity of sound in CdSe and CdS calculated from elastic constants are found to be in good agreement with direct pulse-echo measurements. The critical field for sound amplification in CdS and CdSe for different modes of wave propagation are tabulated. (Author)

AD-626 533 Fld. 20/12, 20/2
CFSTI Prices: HC $1.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 3, 1 Jul-30 Sep 62,
by Lebo Shiozawa, J. M. Jost, S. S. Devlin, G. P.Chotkevys, and J. L. Barrett. 1 Nov 62, 23p. Contract AF33 (657)-7399

Unclassified report

See also AD-626 532.

Descriptors: (*Semiconductors, Solid state physics), Cadmium alloys, Selenium alloys, Cadmium compounds, Sulfides, Zinc alloys, Tellurium alloys, Intermetallic compounds, Vapor pressure, Heat of sublimation, Entropy, Phase studies, Diffusion, Thermal epansion, Electrical properties, Elasticity, Ionization, Crystal growth, Cryogenics

New data on the temperature dependence of the vapor pressure of CdSe, determined by a free-sublimation method, yielded improved values for the standard heat and entropy of sublimation of 84 kcal/mole and 51 cal/mole/K respectively. The pressure-temperature projection of the Cd-rich portion of the Cd:Se phase diagram was established by observing the state of CdSe crystals subjected to known temperatures and Cd-pressures. The maximum Cd-pressure with which solid CdSe can be in equilibrium is 16.6 atm. This occurs at a crystal temperature of 1145C. The diffusion constant of Cd in CdSe was found to be 4.4 x 10 to the 11th power sq cm /sec at 904C. This is in approximate agreement with earlier measurements. The thermal expansion coefficients of CdS and CdSe parallel to c were found to be approximately 60% of those perpendicular to c. A complete set of elastic, dielectric, and piezoelectric constants of CdTe at 77K were established. Analysis of Hall effect measurements on ZnTe yields a hole effective mass of 0.60 = .05m and an acceptor ionization energy of 0.155 eV. A hydrogenic acceptor level at approximately 0.05 eV was also found. (Author)

AD-626 534 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 4, 1 Oct-31 Dec 62,
by L. R. Shiozawa, J. M. Jost, S. S. Devlin, G. P. Chotkevys, and J. L. Barrett. 1 Feb 63, 35p. Contract AF33 (657)-7399

Unclassified report

See also AD-626 533.

Descriptors: (*Semiconductors, Solid state physics), Selenium alloys, Cadmium alloys, Cadmium compounds, Sulfides, Zinc alloys, Tellurium alloys, Intermetallic compounds, Crystal growth, Emissivity, Crystal lattice defects, Thermal expansion, Diffusion, Heat treatment, Hall effect, Purification, Cryogenics, Luminesecence

Fourth quarter progress in the preparation and properties of II-VI compounds is summarized. Vapor phase growth on large area seed crystals were attempted and results are encouraging. A diffusion-precipitation process involving Cd interstitials and Se vacancies is developed to explain resistivity profiles that result from heat treatments in elemental vapors. Light emission from CdS junctions at 77K by hole injection was achieved and elementary design considerations on achieving coherent emission are discussed. The first photograph of imperfections in CdS taken by an x-ray diffraction technique are shown and discussed. New measurements include the thermal expansion of CdS and CdSe parallel to c, and the energy gaps and lattice constants of ZnSeZnTe mixed crystals. A theoretical analysis of the temperature dependence of Hall carrier concentration leads to a set of linearized equations which includes as a variable a temperature dependent Hall factor r = neR. (Author)

AD-626 535 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 5, 1 Jan-31 Mar 63,
by L. R. Shiozawa, J. M. Jost, S. S. Devlin, G. P. Chotkevys, and J. L. Barrett. 20 May 63, 28p. Contract AF33 (657)-7399

Unclassified report

See also AD-626 534.

Descriptors: (*Semiconductors, Solid state physics), Cadmium compounds, Sulfides, Cadmium alloys, Selenium alloys, Zinc alloys, Crystal growth, Epitaxial growth, Twinning (Crystallography), Crystal structure, Impurities, Phase studies, Intermetallic compounds, Solid solutions, Surface properties, Etching, Hall effect, Vapor pressure, Luminescence, Cryogenics

In the Fifth Quarter, epitaxial growth on large-area seed crystals of CdS was achieved for the first time. Improvements were made in the vertical tube method of crystal growth. Radioisotopic studies of the segregation of impurities during sintering and crystal growth have begun. The similarity of the structure of twins in cubic II-VI crystals and in annealed metals leads to the hypothesis that they have identical origins. Twinning occurs during grain growth whenever a net decrease in interfacial energy results. The minimum vapor pressure of CdSe measured in this laboratory is compared with those measured in three other laboratories and leads to what is now believed to be firm values for this quantity. Improved data on three-phase equilibria in the system Cd:Se are presented. Lattice constant measurements in the system CdSe:ZnSe indicate a wurtzite-sphalerite transition in the vicinity of 50 mole % , and also an im-

miscibility dome within the solid-solubility field of the phase diagram. A consolute temperature of 1030C is estimated. The (0001) surface of CdS is shown to etch in 6N HCl about 50% faster than the (0001) surface. (Author)

AD-626 536 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 6, 1 Apr-30 Jun 63,
by L. R. Shiozawa, J. M. Jost, G. P. Chotkevys, S. S. Devlin, and J. L. Barrett. 8 Aug 63, 46p. Contract AF33 (657)-7399
Unclassified report

See also AD-626 535.

Descriptors: (*Semiconductors, Solid state physics), Cadmium compounds, Sulfides, Cadmium alloys, Selenium alloys, Zinc alloys, Tellurium alloys, Intermetallic compounds, Purification, Radioactivation analysis, Luminescence, Refractive index, Optical properties, Epitaxial growth, Electron optics, Transducers, Delay lines, Doping

Epitaxial growth of CdS and CdSe from the vapor phase was examined by direct visual observations. The relative ease with which large crystals were produced indicates that this should soon become the preferred method of growth. Radioisotopic studies, carried out in newly designed miniature growth furnaces, show that In114 accumulates in the supply which leads to concentration gradients in the sublimed crystals. Crystal color and lowtemperature fluorescence are correlated with In114 concentration. New measurements on injection luminescence from forward biased CdS cells at 77K yield: source brightness approximately 0.01 watts/sq cm, power efficiency = 10 to the minus 8th power to 0.00001 rising rapidly with voltage, rise time <0.2 microsec, decay time approximately/micro'sec and polarization E perpendicular to C > 90%. Refractive index measurements (band edge to 1.5 micros yield long-wavelength optical dielectric constants of 7.26 = 0.03 for ZnTe and 5.96 = 0.02 (E perpendicular to C) and 6.05 = 0.02 (E parallel to C) for CdSe. Electro-optic coeffieients (r sub 13 -r sub 33) and r sub 51 for CdS were determined as 4x10 to the minus 12th power and 3.7 x 10 to the minus 12th power m/V, respectively. (Author)

AD-626 537 Fld. 20/12, 20/2
CFSTI Prices: HC $3.00 MF $0.75
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 7, 1 Jul-30 Sep 63,
by L. R. Shiozawa, J. M. Jost, S. S. Devlin, and G. P. Chotkevys. 5 Dec 63, 61p. Contract AF33 (657)-7399
Unclassified report

See also AD-626 536.

Descriptors: (*Semiconductors, Solid state physics), Cadmium compounds, Sulfides, Cadmium alloys, Selenium alloys, Zinc alloys, Tellurium alloys, Intermetallic compounds, Purification, Sublimation, Crystal growth, Refractive index, Optical properties, Luminescence, Absorption, Transport properties, Transducers, Delay lines, Infrared radiation, Cryogenics

The separation of radioactive Ag during sublimation of CdS and CdSe was investigated and effective distribution coefficients of 0.5 and 0.15, respectively, are estimated. Trial runs in a new, travelling-hot-zone furnace show that large, seed-oriented, crystals of CdSe can be successfully grown. An analysis of precipitation mechanisms in II-VI crystals leads to the conclusion that precipitation of vacancies is required in all cases. New measurements of the refractive indices of CdS (band edge to 1.4 microns) yield long-wave optical dielectric constants of 5.16 = 0.02 for E perpendicular to C and 5.23 = 0.02 for E parallel to C. Birefringence data for CdS and CdSe are compared with the results of others. Measurements on injection luminescence in CdS diodes show that the green emission at 77K peaks at 5194A and has a halfwidth of 150A. A red band at approximately 6500A is also noted. Pulse measurements indicate a 0.2 microsec delay between the start of excitation and the onset of emission. Some measurements at 4.2K are also described. The expressions for the transport properties, applicable when more than one scattering mechanism is present, are obtained in the relaxation time approximation. The expressions are evaluated numerically and compared with several simpler approximations. (Author)

AD-626 538 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 8, 1 Oct-31 Dec 63,
by L. R. Shiozawa, J. M. Jost, S. S. Devlin, and R. M. Broudy. 4 Mar 64, 32p. Contract AF33 (657)-7399 Proj. 302860
Unclassified report

See also AD-626 537.

Descriptors: (*Semiconductors, Solid state physics), Selenium alloys, Cadmium alloys, Cadmium compounds, Sulfides, Zinc alloys, Tellurium alloys, Intermetallic compounds, Crystal growth, Deformation, Crystal lattice defects, Phase studies, Scattering, Luminescence, Transport properties

Vapor-phase growth on oriented seed crystals was emphasized in the Eighth Quarter. A noteworthy accomplishment was the growth of a large twin-free ZnTe crystal by this method. Plastic Deformation of CdS crystals by three-point bending was initiated in this quarter. Early results indicate that slip occurs on (1010) and (1120) planes and that the slip direction is (1120). Rapid deformation occurs above 700C; and the critical resolved shear stress is estimated to be 0.3 kg/sq mm. The system CdSe-ZnSe was investigated and complete solid miscibility is shown to exist between 900 and 1200C. The system ZnS-ZnTe was also investigated and a plausible phase diagram is derived from the X-ray results. The variational method of solving the Boltzmann equation was extended to cover more than one scattering mechanism. Detailed results are presented for mixtures of optical mode and piezoelectric scattering. (Author)

AD-626 539 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 9, 1 Jan-31 Mar 64,
by L. R. Shiozawa, S. S. Devlin, and J. M. Jost. 29 May 64, 28p. Contract AF33 (657)-7399 Proj. 302860
Unclassified report

See also AD-626 538.

Descriptors: (*Semiconductors, Solid state physics), Cadmium compounds, Cadmium alloys, Sulfides, Selenium alloys, Zinc alloys, Tellurium alloys, Intermetallic compounds, Crystal growth, Impurities, Epitoxial growth, Single crystals, Deformation, Luminescence, Transport properties, Crystal lattice defects

Experimental work in the Ninth Quarter continued to emphasize vapor-phase crystal growth on oriented seed crystals of CdS. The effects of inert gas and nonstoichiometric vapor in the growth tube are examined. A possible origin of small-angle boundaries is discussed in terms of dislocations resulting from vacancy precipitation during growth. A newly recognized mode of crystal contamination involving vapor transport agents is discussed. Specific examples of epitaxial growth experiments and some of the difficulties encountered are presented. The intrinsic mobility of CdS, CdSe and ZnTe was calculated using a variational method and the results compared with experiment. The agreement was excellent. (Author)

AD-626 540 Fld. 20/12, 20/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Quarterly rept. no. 10, 1 Apr-30 Jun 64,
by L. R. Shiozawa, S. S. Devlin, and J. M. Jost. 8 Aug 64, 41p. Contract AF33 (657)-7399 Proj. 302860
Unclassified report

See also AD-626 539.

Descriptors: (*Semiconductors, Solid state physics), Cadmium compounds, Sulfides, Cadmium alloys, Selenium alloys, Zinc alloys, Tellurium alloys, Intermetallic compounds, Crystal growth, Deformation, Crystal lattice defects, Electrical properties, Doping, Hardness, Transport properties, Epitaxial growth, Anisotropy, Lithium, Sodium, Optical properties

Experimental vapor phase growth of CdS on oriented seeds has resulted in a better understanding of initiating seed growth. The heat balance at the seed, determined mainly by radiation, is the most important factor affecting the temperature of the growth surface. The electrical properties of CdS are greatly modified by plastic deformation due mainly to the effect of dislocation climb. Knoop microhardness tests have shown hardness anisotropies on the different surfaces of CdS, in comparing both similar directions on different surfaces and different directions on the same surface. Electroelastic measurements have been made on Li- and Na-doped CdS crystals with some unaccountable results. The anisotropies of the mobility and Hall effect in semiconductors with slightly elliptical bands and optical mode scattering were calculated under very restrictive assumptions. The numerical values are not significant but the explicit temperature dependence of the anisotropies is of interest. The mobility of several samples of CdS and CdSe were fitted to the theory taking into account all scattering mechanisms. The fit was used to determine the impurity concentrations. (Author)

AD-626 553 Fld. 20/12, 20/8
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
NMR QUADRUPOLAR RELAXATION IN HIGH AND LOW EXTERNAL FIELDS,
by B. C. Johnson, and W. I. Goldburg. 1964, 2p. Contract DA-ARO (D)-31-124-G284
AROD 2636:7
Unclassified report

Availability: Published in Nuclear Magnetic Resonance and Relaxation in Solids Proceedings of the Coloque Ampere (13th) p77-8 Leuven 1964. Copies to DDC users only.

Descriptors: (*Nuclear magnetic resonance, Relaxation time), Nuclear spins, Crystal lattices

A calculation is described for computing the spin-lattice relaxation time T1 of cubic quadrupolar solids in low fields as well as in high fields.

AD-626 648 Fld. 20/12, 20/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS

DE HAAS-VAN ALPHEN EFFECT AND FERMI SURFACE OF THE INTERMETALLIC COMPOUNDS AUA12, AUGA2 AND AUIN2,
by J. P. Jan, W. B. Pearson, Y. Saito, M. Springford, and I. M. Templeton. 3 Jul 65, 21p.
NRC 8764

Unclassified report

Availability: Published in Philosophical Magazine v12 n120 p1271-91 Dec 1965. Copies to DDC users only.

Descriptors: (*Intermetallic compounds, Atomic energy levels), (*Crystal lattices, Magnetic fields), (*Magnetic fields, Oscillation), Gold alloys, Aluminum alloys, Gallium alloys, Indium alloys, Band theory of solids, Resistance (Electrical), Magnetic properties

The de Haas-van Alphen effect was measured in the three intermetallic compounds AuA12, AuGa2, and AuIn2 (fluorite structure), by the puls field method and by the torque method. The agreement between experimental results and Fermi surface derived from the free-electron model, assuming seven conduction electrons per primitive cell, is generally not too bad, suggesting that this model is valid as a first approximation for interpreting the experimental results. Similarities and differences between the three compounds are discussed. (Author)

AD-626 649 Fld. 20/12
CFSTI Prices: HC $4.00 MF $1.00
CALIFORNIA UNIV SANTA BARBARA DEPT OF PHYSICS
QUANTITATIVE STUDIES BY OPTICAL SPECTROSCOPY OF ENERGY EXCHANGE MECHANISMS IN SIMPLE GASES AND SOLIDS.
Semi-annual technical rept. 1 Jul 65-1 Jan 66 (Doctoral thesis),
by Harold D. Pruett. 1 Jan 66, 143p. Rept. no. TR-12
Contract Nonr-4222 (01) ,ARPA Order-125

Unclassified report

See also AD-617 797.

Descriptors: (*Helium group gases, Carriers (Semiconductors)), (*Solidified gases, Carriers (Semiconductors)), (*Crystal growth, Solidified gases), Neon, Argon, Krypton, Xenon, Polonium, Crystal counters, Purification, Vapors, Alpha particles, Ionic current, Spectroscopy

Free-carrier mobility studies were made in condensed Ne, Ar, Kr and Xe using a crystal counter technique. Crystal growth methods based on Bridgmen's technique were developed to permit growth of solid samples directly between the electrodes. Electron-ion pairs were generated in the materials by means of a Po210 alpha-particle source which was electro-chemically deposited on one electrode of the parallel electrode arrangement.

AD-625 672 See Fld. 7/4

AD-625 694 See Fld. 9/3

AD-625 709 See Fld. 20/3

AD-625 876 See Fld. 11/6

AD-625 912 See Fld. 11/6

AD-625 952 See Fld. 5/1

AD-626 132 See Fld. 20/9

AD-626 168 See Fld. 14/2

AD-626 329 See Fld. 20/3

AD-626 369 See Fld. 20/2

AD-626 397 See Fld. 20/6

AD-626 398 See Fld. 7/4

AD-626 400 See Fld. 20/2

AD-626 469 See Fld. 9/1

AD-626 495 See Fld. 20/2

AD-626 595 See Fld. 7/4

AD-626 600 See Fld. 18/3

AD-626 624 See Fld. 7/4

AD-626 642 See Fld. 7/4

20/13. THERMODYNAMICS

AD-625 735 Fld. 20/13, 7/4
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE THERMODYNAMICS OF THE GRAPHITE-CARBON VAPOR SYSTEM.
by F. J. Krieger. Dec 65, 33p. Rept. no. RM-3326-1-PR
Contract AF49 (638)-1700

Unclassified report

Descriptors: (*Thermodynamics, Graphite), (*Graphite, Thermodynamics), Ablation, Carbon, High temperature research, Pressure, Chemical equilibrium, Reentry vehicles, Materials

The purpose of this study is the thermodynamic investigation of graphite over a range of temperatures up to 6000K and pressures up to 10 to the 3rd atmospheres. Two sets of equilibrium composition equations were used--one representing a pure gas phase, the other a heterogeneous system of gas and solid carbon. The heterogeneous chemical system is unique in that, although it involves two phases and a variety of chemical species, it comprises only one chemical element. The mathematical solution of the system of equations representing the heterogeneous chemical system was subject, therefore, to the physical constraint of one degree of freedom. The results of the computational program are presented in both tabular and graphic form. The latter is a conventional Mollier diagram in which specific enthalpy is plotted against specific entropy, with cross plots of temperature, pressure, molecular weight, and moles of condensed carbon. (Author)

AD-625 791 Fld. 20/13
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE MECHANISM OF BOILING OF LIQUID SODIUM ON A HEATING SURFACE AT FREE CONVECTION,
by V. I. Deev, and A. N. Solovev. 27 Oct 65, 13p. Rept. no. FTD-TT-65-907
TT 66-60139

Unclassified report

Unedited rough draft trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v7 n6 p8-12 1964.

Descriptors: (*Sodium, Boiling), Liquid metals, Bubbles, Vapors, Heat transfer, Heat of vaporization, Convection, Pressure, Heating, USSR

Evaluated are the critical nucleus radius, the growth rate and separation diameter, the bubble separation frequency with sodium boiling on a heating surface with natural convection. It has been shown that all these quantities differ essentially from the similar ones with water boiling at a normal pressure. (Author)

AD-625 902 Fld. 20/13, 10/1, 11/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
HIGH TEMPERATURE PROPERTIES OF SODIUM.
Progress rept. no. 5, 1 Oct-31 Dec 61,
by C. T. Ewing, J. P. Stone, J. R. Spann, T. A. Kovacina, and R. R. Miller. Jan 62, 10p. Rept. no. NRL-1263

Unclassified report

See also AD-625 903.

Descriptors: (*Sodium, Thermodynamics), (*Liquid metals, Electric power production), (*Thermodynamics, Sodium), Density, Specific heat, High-temperature research, Solubility, Niobium alloys, Zirconium alloys, Vapor pressure, Measurement, Corrosive liquids, Vapors

An experimental program was established to measure thermophysical properties of sodium and sodium vapor to 2500 F. The status of the various property measurements and some of the problem areas encountered at these temperatures are discussed. (Author)

AD-625 903 Fld. 20/13, 10/1, 11/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
HIGH TEMPERATURE PROPERTIES OF SODIUM.
Progress rept. no. 4, 1 Apr-30 Sep 61,
by C. T. Ewing, J. P. Stone, J. R. Spann, T. A. Kovacina, and R. R. Miller. 6 Oct 61, 14p. Rept. no. NRL-1236

Unclassified report

See also AD-625 902.

Descriptors: (*Sodium, Thermodynamics), (*Liquid metals, Electric power production), (*Thermodynamics, Sodium), Vaapors, Thermoelectricity, Thermocouples, High-temperature research, Density, Specific heat, Measurement, Niobium alloys, Zirconium alloys, Solubility, Corrosive liquids

An experimental program was established to measure thermophysical properties of sodium and sodium vapor which will be required in the design of turboelectrttric systems utilizing sodium ass the working fluid to 2500F. This report covers the status of the measurement program and presents thermoelectric stability data for several noble metal thermocouples at 2500F. (Author)

AD-625 979 Fld. 20/13, 7/4
LYMAN LAB OF PHYSICS HARVARD UNIV CAMBRIDGE MASS
NON LOCAL TRANSPORT COEFFICIENTS CORRELATION FUNCTIONS,
by Paul C. Martin. 1964, 29p. Contract AF49 (638)-589 Proj. AF-9751 Task 975101
AFOSR 65-1829

Unclassified report

Availability: Published in Statistical Mechanics of Equilibrium and Non-Equilibrium. Proceedings of the International Symposium on Statistical Mechanics and Thermodynamics p100-25 Aachen, Germany Jun 15-20 1964. Copies to DDC users only.

Descriptors: (*Statistical functions, Statistical mechanics), (*Transport properties, Statistical functions), Thermodynamics, Momentum, Integral transforms

Postulated expressions for transport coefficients are considered as limiting values of correlation functions, with special emphasis on their physical significance. The correlation functions of the densities of conserved variables in steady states manifest all the linearized hydrodynamic properties of these steady states. Thus they contain both the damping of the hydrodynamic modes, their velocity, and their strength. This information appears in the Fourier transform of slowly varying space-time correlation functions in a natural manner. One limit of these functions yields the familiar expressions for transport coefficients when there are

no long range forces. This point is presented by generalizing the simple example of a one component substance at very low temperature. (Author)

AD-625 990 Fld. 20/13
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
TRANSIENT STRESSES IN SOLIDS INDUCED BY RADIANT SURFACE HEATING,
by Ulric S. Lindholm. 23 Feb 65, 5p. Contract AF49 (638)-1119
AFOSR 65-1740

Unclassified report

Availability: Published in AIAA Journal, v3 n6 p1203-5 Jun 1965. Copies to DDC users only.

Descriptors: (*Thermal stresses, Solids), Surfaces, Heating, Stresses, Surface temperatures

If the surface of a solid is exposed to a very high rate of radiant heating, transient stresses may be induced either by thermoelastic coupling at low surface temperatures or by rapid vaporization at high surface temperatures. Some preliminary considerations of this phenomena are discussed. An experiment is described for detecting transient stresses in a rod-type lead specimen resulting from a high thermal flux at one end. The specimen is heated in an arc-imaging facility. The transient pressures measured appear in qualitative agreement with predictions based on rapid vaporization from the surface. More quantitative agreement will require accurate knowledge of the surface emissivity surface temperature, and internal energy distribution in the solid or melt. (U)

AD-626 227 Fld. 20/13, 20/3
CFSTI Prices: HC $2.00 MF $0.50
OREGON UNIV EUGENE DEPT OF PHYSICS
CONNECTED DIAGRAM EXPANSION OF TRANSPORT COEFFICIENTS. I. ELECTRON-IMPURIITY SYSTEM.
Technical rept.,
by S. Fujita. Jan 66, 36p. Rept. no. TR-6
Contract Nonr-2771 (05) Proj. NR-017-633

Unclassified report

Descriptors: (*Transport properties, Power series), (*Electrons, Impurities), Electrical conductance, Distribution functions, Kinetic theory, Statistical mechanics, Density

A connectied-diagram expansion method is applied in the evaluation of the correlation function formulas for transport coefficients of an electron-impurity system. This method does not utilize any special representation and is applicable whether or not the system is subjected to a time-dependent electric field and whether or not it is subjected to a constant magnetic field. The connection between the correlation function formula and the generalized transport equation of Kohn and Luttinger is clarified. The first density correction to the conventional formula for the static conductivity of a weakcoupling system is explicitly formulated in integrals with the assumption of a more realistic distribution of impurities than the usually assumed uniform distribution. The expansion in powers of the impurity density, whose validity may be questioned in the light of recent controversies over the virial expansion of transport coefficients of a classical gas, does not seem to lead to difficulties for weak, short range impurity potentials. The cases of dynamic conductivity and magnetoresistance are discussed in terms of generalized transport equations. (Author)

AD-626 260 Fld. 20/13, 20/8
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
HITTING AND MARTINGALE CHARACTERIZATIONS OF ONE-DIMENSIONAL DIFFUSIONS,
by Michael A. Arbib. 30 Sep 63, 17p. Contract AF33 (616)-7783 Grant .NIH-NB-01865-05

Unclassified report

Availability: Published in Zeitschrift fur Wahrscheinlichkeitstheorie und Verwandte Gebiete (West Germany. v4 p232-47 1965. Copies to DDC users only.

Descriptors: (*Brownian motion, Stochastic processes), (*Stochastic processes, Diffusion), Statistical analysis, Kinetic theory, Probability, Partial differential equations

It is shown that, for a large class of one-dimensional diffusions (i. e. strong Markov processes with continuous sample paths): if x (t) is a continuous stochastic process possessing the hitting probabilities and mean exit times of the given diffusion, then x (t) is Markovian, with the transition probabilities of the diffusion. For a diffusion x (t) with natural boundaries at = infinity, there is constructed a sequence p (t, x) of functions with the property that the p (t, x (t)) are martingales, reducing in the case of the Brownian motion to the familiar martingale polynomials.

AD-625 788 **See Fld. 21/2**

AD-625 870 **See Fld. 20/4**

AD-625 891 **See Fld. 16/4**

AD-625 930 **See Fld. 20/3**

AD-626 061 **See Fld. 7/4**

AD-626 201 **See Fld. 20/4**

AD-626 452 **See Fld. 3/2**

20/14. WAVE PROPAGATION

AD-625 731 Fld. 20/14, 9/2
CFSTI Prices: HC $2.00 MF $0.50
NAVY ELECTRONICS LAB SAN DIEGO CALIF
A COMPUTER PROGRAM FOR TRACING THE RAY PATHS OF RADIO WAVES IN THE IONOSPHERE.
Research rept. for 15 Sep-24 Dec 64,
by J. R. Wilts. 2 Sep 65, 44p. Rept. no. NEL-1316
Proj. NEL-B14201

Unclassified report

Descriptors: (*Radio waves, Ionospheric propagation), (*Ionospheric propagation, Radio transmission), (*Programming (Computers), Radio transmission), Ionosphere, Electromagnetic waves, Propagation, Mathematical prediction

A computer program was developed for tracing ray paths through an arbitrary ionosphere, and is now ready for application to specific problems. The program correctly traces the opposite lateral deviations of the ordinary and extraordinary rays in good agreement with correct theoretical results. (Author)

AD-625 741 Fld. 20/14
MITRE CORP BEDFORD MASS
POLARIZATION, CROSS SECTION, AND THE STOKES PARAMETERS,
by Marvin H. Hewitt. 2 Jun 65, 4p. Contract AF19 (628)-2390 Proj. AF-615-1
ESD TR-65-121

Unclassified report

Availability: Published in Proceedings of the IEEE v53 n8 p1143 Aug 1965. Copies to DDC users only.

Descriptors: (*Electromagnetic waves, Poollarization), Intensity, Matrix algebra

It is shown how the phenomenological Stokes four-vector, describing the intensity and polarization of an electromagnetic wave, can be exhibited via a coherency matrix. (Author)

AD-625 742 Fld. 20/14
MITRE CORP BEDFORD MASS
EFFECTS OF MAGNETO-IONIC PROPAGATION ON THE POLARIZATION SCATTERING MATRIX.
Revised ed.,
by S. H. Bickel, and R. H. T. Bates. 6 May 65, 4p. Rept. no. MTP-4
Contract AF19 (628)-2390 Proj. DA-496-3
ESD TR-65-105

Unclassified report

Revision of manuscript submitted 26 Mar 65.

Availability: Published in Proceedings of the IEEE v53 n8 p1089-91 Aug 1965. Copies to DDC users only.

Descriptors: (*Ionospheric propagation, Radar signals), (*S-matrix, Polarization), Scattering, Magnetic fields, Radio waves, Wave transmission, Antenna radiation patterns, Radar antennas, Atmospheric refraction, Radar targets, Magneto-optic effect

Magneto-ionic propagation effects are considered at radio frequencies that are sufficiently high so that there is negligible physical separation between the ordinary and extraordinary propagation paths. It is recognized that the sensible magneto-ionic propagation effects are birefringence and Faraday rotation. A matrix representation for magneto-ionic propagation is employed in order to facilitate the determination of the effects of magnetoionic propagation on the polarization scattering matrix of an arbitrary, monostatic radar target. It is shown that the propagation path must be calibrated with a known, fourway symmetric target when both birefringence and Faraday rotation are present, if it is desired to eliminate the effects of magneto-ionic propagation. However, the determinant of the polarization scattering matrix and the trace of the power scattering matrix are, in general, unaffected by magneto-ionic propagation. If birefringence is absent, then even if the radar target is arbitrary and unknown, the effects of Faraday rotation can be accounted for in a particularly simple manner if the scattering matrix is referred to circular polarization. (Author)

AD-625 744 Fld. 20/14
MITRE CORP BEDFORD MASS
SOME INVARIANT PROPERTIES OF THE POLARIZATION SCATTERING MATRIX,
by S. H. Bickel. 5 Apr 65, 4p. Contract AF19 (628)-2390
ESD TR-65-117

Unclassified report

Availability: Published in Proceedings of the IEEE v53 n8 p1070-2 Aug 1965. Copies to DDC users only.

Descriptors: (*Electromagnetic wave reflections, Radar targets), (*Invariance, S-matrix), Polarization, Scattering, Radar antennas

A set of parameters can be based on properties of the polarization scattering matrix which are invariant to change in the axial ratio of the polarization ellipse for the measuring antenna, or to rotation of the antenna about the line of sight, and have the advantage that they are free of the effects of Faraday rotation and of certain errors in antenna polarization, yet depend upon the nature of the scattering body. The null polarization and eigenpolarization are simply related to the invariant quantities. Not all of the significant characteristics of the scattering matrix can be specified in terms of invariant quantities, since two degrees of freedom are necessary, one to account for the axial ratio of measuring antenna and one to account for the relative orientation of the antenna and scatterer about the line of sight. The decomposition of these effects into the product of a rotation operator and an ellipticity operator offers a convenient method for critical examination of polarization dependent characteristics. (Author)

AD-625 969 Fld. 20/14, 20/9
BELL TELEPHONE LABS INC WHIPPANY NJ
E-MODE PROPAGATION IN A PLANE-STRATIFIED PLASMA.
Doctoral thesis,
by Peter Hirsch, and Jerry Shmoys. 27 Nov 64, 7p. Contract AF49 (638)-1402
AFOSR 65-2448

Unclassified report

Revision of manuscript submitted 16 Oct 1964.

Availability: Published in RADIO SCIENCE Journal of Research NBS/USNC-URSI v69D n4 p521-7 Apr 1965. Copies to DDC users only.

Descriptors: (*Electromagnetic waves, Plasma medium), (*Plasma medium, Electromagnetic waves), Propagation, Wave transmission, Differential equations, Dielectric propagation, Attenuation, Numerical analysis

The problem of propagation of plane electromagnetic waves polarized in the plane of incidence in a planestratified isotropic plasma (regarded as a dielectric) is dealt with by reducing it to the solution of an ordinary differential equation which is singular at the level of plasma resonance. The absorption of power in the resonant layer is calculated approximately in two cases involving a linear profile. In the first the relative dielectric constant varies linearly in a thin transition layer between two homogeneous regions. In the second, the dielectric constant is linearly varying over a large interval. (Author)

AD-626 144 Fld. 20/14, 20/9
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB
SURFACE WAVES AT A PLANE INTERFACE BETWEEN VACUUM AND PLASMA WITH THE MAGNETOSTATIC FIELD NORMAL TO THE INTERFACE.
Physical sciences research paper,
by Kondagunta U. Sivaprasad, and Sengadu R. Seshadri. Oct 65, 30p. Rept. no. PSRP-155
Proj. AF-4600 Task 460011
AFCRL 65-753

Unclassified report

Descriptors: (*Electromagnetic waves, Plasma medium), Electromagnetism, Propagation, Magnetic fields, Statics, Plasma physics, Waveguides, Surface properties

The characteristics of the surface waves sustained by a plane interface which separates semi-infinite regions of vacuum and magnetoionic medium are investigated for the case in which the magnetostatic field is normal to the interface. It is found that plane surface waves exist if the gyromagnetic frequency is less than the plasma frequency and in the range of frequencies lying between the gyromagnetic frequency and 1/square root of 2 times the upper hybrid resonant frequency. The phase velocity of the surface waves is always less than the velocity of electromagnetic waves in free space and it decreases monotonically with the increase in the frequency and goes to zero at 1/square root of 2 times the upper hybrid resonant frequency. (Author)

AD-626 157 Fld. 20/14, 17/2.1
CFSTI Prices: HC $1.00 MF $0,50
AEROSPACE CORP SAN BERNARDINO CALIF
ANALYSIS OF THE FREQUENCY DEPENDENCE OF MAN-MADE RADIO NOISE,
by E. N. Skomal. Dec 65, 21p. Rept. no. TDR-669 (S6951-24)-2
Contract AF04 (695)-669
BSD TR-66-1

Unclassified report

Descriptors: (*Radio interference, Noise generators), (*Noise generators, Radio interference), Very high frequency, Ultrahigh frequency, High frequency, Electromagnetic waves, Sources, Probability, Frequency, Analysis, Theory, Radio transmission

Two theoretical noise generation processes have been proposed and analyzed as models for the experimentally observed frequency dependence of man-made radio noise in the frequency intervals 10 kcps to 20 mcps and 100 mcps to 500 mcps. The computed results for the normalized variation of the noise spectral power density as a function of frequency have been shown to agree within the statistical variation of the experimental data for both frequency intervals. The proposed mechanism of noise generation in the higher frequency interval presumes the man-made noise arises from randomly occurring narrow i impulses. In the lower frequency interval the noise emissions are modeled assuming the pulses form a train of independent events with an average frequency of occurrence, v. The noise arising from both emission processes is presumed to be attenuated in a manner controlled by the propagation statistics applicable to radio transmission over irregular terrain from low antenna heights.

AD-626 166 Fld. 20/14, 4/1
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
GROUP PROPAGATION IN THE WHISTLERHYDROMAGNETIC EXTENSION OF MAGNETOIONIC THEORY.
Environmental research papers,
by Gideon Kantor, and Frank A. Pivarunas. Nov 65, 32p. Rept. no. ERP-153
Proj. AF-4603 Task 460302
AFCRL 65-811

Unclassified report

Descriptors: (*Ionospheric propagation, Magnetohydrodynamics), (*Whistlers, Ionospheric propagation), Magnetic fields, Upper atmosphere, Refractive index, Electron density, Protons

An exact formulation is presented of the propagation of wave packets at whistler and hydromagnetic frequencies in a collision-free, electrically-neutral mixture of electrons and ions of one type. Expressions are derived for mu', the group refractive index, and for alpha, the angle between the direction of propagation of the wave packets and the wave normal. Computed values of mu' and alpha for the electron-to-proton mass ratio are plotted as a function of X, the square of the ratio of electron plasma frequency to wave frequency. The plots for high X values are applicable to whistler and hydromagnetic wave propagation in the magnetosphere. (Author)

AD-626 196 Fld. 20/14, 20/9
CFSTI Prices: HC $2.00 MF $0.50
MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
MICROWAVE GENERATION BY MEANS OF INTERACTION WITH ANISOTROPIC MEDIA.
Quarterly progress rept. no. 1, 15 Jun-15 Sep 65,
by C. A. Brackett, G. T. Konrad, and J. E. Rowe. Oct 65. 48p. Contract DA-28-043-AMC-01315 (E) Proj. DA-1P6-22001-A-055-04
ECOM 01315-1-T

Unclassified report

Descriptors: (*Electron beams, Plasma physics), (*Plasma physics, Electron beams), (*Microwaves, Harmonic generators), Electromagnetic waves, Propagation

The equations pertinent to the interaction of an electron beam and a stationary plasma with an electromagnetic wave are derived. The purpose is to investigate, on a small-signal basis, the generation of harmonics in a microwave beam-plasma system. The Boltzmann-Vlasov equation, with a constant viscous damping term to account for electron-neutral collisions, is used and all field quantities are expanded in a power series of an arbitrary expansion parameter E. The coefficients of each power of E are then expanded as harmonic functions in time whose amplitudes are slowly varying functions of position. An approximate set of equations is then given which in principle can be solved by the method of successive approximations. A device for studying amplification and harmonic generation in a beam-plasma system is in the initial design stages. A plasma column contained in a glass tube through which an electron beam is to be passed will ultimately be used. The coupling to the beam-plasma system will be accomplished by means of elliptic cavity couplers. These couplers will be movable for maximum coupling to each of the various harmonic components. The input impedance for a proposed elliptic cavity coupler has been calculated and is presented in this report. (Author)

AD-626 197 Fld. 20/14, 20/9
CFSTI Prices: HC $1.00 MF $0.50
FORSVARETS FORSKNINGSINSTITUTT KJELLER (NORWAY)
SPACE CHARGE WAVES IN A SEMICONDUCTOR PLASMA.
by Kjell A. Ingebrigtsen. 11 Nov 64, 20p. Rept. no. Scientific-10 ,FFIE-46
Contract AF64 (052)-484
AFCRL 65-773

Unclassified report

Descriptors: (*Cyclotron waves, Plasma physics), (*Plasma physics, Electrical impedance), Semiconductors, Recombination reactions, Space charges, Propagation, Acoustics, Norway

An expression for the impedance of a recombinating semiconductor plasma in presence of static electric and magnetic fields is developed. This general expression is specialized to detailed discussions of the cases where the static electric and magnetic fields are parallel and perpendicular respectively. Recombinations are accounted for only when the magnetic field is zero and when the direction of propagation is parallel to the static electric field, otherwise it is neglected. (Author)

AD-626 236 Fld. 20/14
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
METHODS OF SOLVING THE COUPLED EQUATIONS OF PLANE WAVE PROPAGATION IN THE IONOSPHERE,
by J. J. Gibbons. 1965, 4p. Contract AF19 (122)-44

Unclassified report

Availability: Published in The Physics of the Ionosphere, Report of 1954 Cambridge Conference p351-4. Copies to DDC users only.

Descriptors: (*Ionospheric propagation, Radio waves), (*Radio waves, Ionospheric propagation), Wave transmission, Mathematical models, Differential equations, Ionosphere, Electron density, Wave function

A resume is given of methods used in this Laboratory to obtain solutions of the coupled differential equations of plane wave propagation in the ionosphere. The complex coefficients, functions of height, are understood to be given as tables computed from some electron densitycollision frequency model. The methods are for the most part designed for use with a desk computing machine and planimeter. The coupling problem is treated by the method of variation of parameters when coupling is not too large. But as the levels of critical collision frequency and critical electron density approach each other, the coefficients in the coupled equations become infinite. This case has been solved by selecting new modes whichcich aavoid this difficulty.

AD-626 240 Fld. 20/14, 20/6
POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST
QUASI-OPTICAL METHODS IN MICROWAVE PROPAGATION AND DIFFRACTION.
Research rept.,
by Leopold B. Felsen. 2 May 65, 16p. Rept. no. PIBMRI-1282-65
Contract AF19 (628)-2357 Proj. AF-5635 Task 563501
AFCRL 65-519
Unclassified report

Availability: Published in Applied Optics, v4 p1217-28 Oct 1965. Copies to DDC users only.

Descriptors: (*Microwaves, Optics), (*Electromagnetism, Optics), (*Optics, Microwaves), Electromagnetic waves, Propagation, Diffraction, Waveguides, Microwave equipment

The use of ray-optical techniques in the study of microwave radiation, propagation, diffraction and ducting is reviewed, and relevant concepts are illustrated by simple examples. Emphasis is placed on the relation between ray-optical and wave-optical procedures, and on the role of modal methods in the study of quasi-optical phenomena. A number of microwave devices and components, designed on the basis of ray optics, are included in the discussion. (Author)

AD-625 694 **See Fld. 9/3**

AD-625 853 **See Fld. 17/2**

AD-625 976 **See Fld. 17/9**

AD-626 195 **See Fld. 9/1**

AD-626 199 **See Fld. 4/1**

AD-626 203 **See Fld. 4/1**

AD-626 232 **See Fld. 4/1**

AD-626 233 **See Fld. 4/1**

AD-626 234 **See Fld. 4/1**

21/2. COMBUSTION AND IGNITION

AD-625 788 Fld. 21/2, 20/13
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A DISCUSSION OF THE FORMULA USED IN COMPUTING THE AMOUNT OF FUEL REQUIRED TO PRODUCE COMBUSTION GASES AT A GIVEN TEMPERATURE IN A COMBUSTION OR AN AFTERBURNER,
by Tsai Ruei-Shen. 25 Oct 65, 6p. Rept. no. FTD-TT-65-714
TT 60136
Unclassified report

Trans. of Chi Hsieh Kung Ch'eng Hsueh Pao (Chinese People's Republic) v12 n3 p94-6 1964.

Descriptors: (*Combustion chamber gases, Thermodynamics), (*Fuel consumption, Combustion chambers), Afterburners, Hydrocarbons, Chemical equilibrium, China

A generalization of the formula for calculating the amount of fuel required to produce combustion gases at a given temperature in a combustion chamber or in an afterburner is presented. The applicability of the original formula based on (CH3)m fuel to other fuels is discussed. (Author)

AD-625 804 Fld. 21/2, 19/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COMBUSTION AND EXPLOSION,
by V. Voevodskii, and M. Lavrentev. 17 Dec 65, 8p. Rept. no. FTD-TT-65-1354
TT 66-60148
Unclassified report

Unedited rough draft trans. from Izvestiya (USSR) 8 Jan p3 1965.

Descriptors: (*Combustion, Reviews), (*Explosions, Reviews), Explosive gases, Detonations, Shock waves, USSR

A popularized discussion is given of work on detonation and burning phenomena in combustable gases which has been undertaken at the Institute of Hydronamics of the Academy of Sciences USSR, Siberian branch.

AD-625 832 Fld. 21/2
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
SOME ASPECTS OF COMBUSTION KINETICS: ANALYTICAL SURVEY.
Rept. no. 1 on ATD work assignment no. 68,
by Victor Seemann. 6 Dec 65, 136p. Rept. no. ATD-65-100
TT 66-60153
Unclassified report

Consists of three parts. Part I: Analysis of material presented in Part II. Part II: Abstracts and translations of recent material pertaining to the kinetics of supersonic combustion. Part III: Abstracts which have appeared during the first half of 1965. Rept. on Surveys of Communist World Scientific and Technical Literature.

Descriptors: (*Combustion, Reaction kinetics), Shock waves, Supersonic flow, Ignition, Detonations, Detonation waves, Stabilization, Thermodynamics, Gases, Reports, Abstracts, USSR

The report consists of three parts. Part I is an analysis of the material presented in Part II. Part II contains abstracts and translations of recent material pertaining to the kinetics of supersonic combustion. Part III presents abstracts which appeared in the Aerospace Technology Division (ATD) Press during the first half of 1965, and which may have some degree of relevance to the more general problem of supersonic combustion. The material in Part III was compiled in light of the modified requirements to facilitate the readers' search. No attempt was made to include material dealing with jet mixing, since this subject had been covered in ATD reports P-65-7, P-65-15, P-65-33, P-65-41, and a report soon to be published. (Author)

AD-625 981 Fld. 21/2, 7/4
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)
HYDROGEN-ATOM CONCENTRATIONS IN HYDROGEN/ OXYGEN/NITROGEN FLAMES,
by K. N. Bascombe. 1964, 12p. Rept. no. WAC/153/072 ,Offprint-65/15
Unclassified report

Availability: Published in Symposium (International) on Combustion (10th) p55-64 1965. Copies to DDC users only.

Descriptors: (*Flames, Reaction kinetics), (*Hydrogen, Flames), (*Nitrogen, Flames), (*Oxygen, Flames), Concentration (Chemistry), Hydrogen peroxide, Combustion products, Great Britain

An investigation was made of the kinetics of low-pressure (30 to 100 mm Hg), slow-burning, fuel-rich hydrogen/nitrogen/oxygen flames (containing up to 80% nitrogen). The results indicate that a key part is played by the hydroperoxo entity, which is formed by the reaction: H + O2 + M (yields) HO2 + M. The mechanism of its removal is uncertain, but it is possible that the following reactions may be involved: H + HO2 (yields) H2 + O2; H + HO2 (+M) (yields) H2O2 (+M).

AD-626 243 Fld. 21/2
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y
THE IGNITION OF FLOWING HYDROCARBON/AIR MIXTURES BY A HYDROGEN PILOT FLAME,
by Joseph A. Schetz, and Joseph Jannone. 1964, 14p. Contract AF49 (638)-1503 ,AF49 (638)-991
AFOSR 64-2008
Unclassified report

Availability: Published in Pyrodynamics, v2 p1-14 1965. Copies to DDC users only.

Descriptors: (*Hydrocarbons, Ignition), (*Fuels, Ignition), (*Ignition systems, Effectiveness), (*Flames, Hydrogen), Air, Mixtures, Turbulence, Jets, Supersonic flow

The paper is concerned with an analytical study of the mechanism of ignition of a flowing hydrocarbon/air mixture by a hydrogen pilot flame in fully turbulent flow. Particular attention is directed to igniting such a mixture under static conditions precluding spontaneous thermal ignition. It is shown that a jet of a combustible mixture at a temperature sufficient to initiate reaction with the free stream air provides a more effective ignition source than a jet of inert gas at a considerably higher initial static temperature. (Author)

AD-626 464 Fld. 21/2, 7/4
CFSTI Prices: HC $4.00 MF $0.75
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
REACTION KINETICS, THERMODYNAMICS, AND TRANSPORT IN THE HYDROGEN-BROMINE SYSTEM: A SURVEY OF PROPERTIES FOR FLAME STUDIES,
by Edwin S. Campbell, and Robert M. Fristrom. 14 Oct 57, 113p. Rept. no. TG-293
Contract AF49 (638)-169 ,NOrd-7386
Unclassified report

Prepared in cooperation with New York Univ., N. Y. Dept. of Chemistry.

Descriptors: (*Flames, Physical properties), (*Hydrogen, Flames), (*Bromine, Flames), Reaction kinetics, Thermodynamics, Transport properties, Mixtures, Reviews

Flame theory and experimental techniques have advanced to the point where direct comparison of theory and experiment should be possible. This review has sought to aid these studies by collecting the best available data and by pointing out its limitations. Theoretical calculations on the hydrogen-bromine flame using presently available data are important primarily as mathematical experiments, to discover the significance of various physical processes within the flame. More precise experimental studies of high temperature kinetic and transport properties should be made as a basis for the necessary detailed comparison of theory with experiment. (Author)

AD-626 576 Fld. 21/2, 21/9.2
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
COMBUSTION INSTABILITY: ACOUSTIC INTERACTION WITH A BURNING PROPELLANT SURFACE,
by R. W. Hart, and F. T. McClure. Oct 58, 47p. Rept. no. TG-309
Contract NOrd-7386
Unclassified report

Descriptors: (*Combustion, Stability), (*Solid rocket propellants, Combustion), Burning rate, Acoustic properties, Surfaces, Perturbation theory

A theory of the response of a burning solid to a sound wave is developed, based on time-dependent solutions of the transport equations relevant to a combustible having idealized physical and chemical properties. The development is restricted to small perturbations about the steady state conditions for a rather simple model whose parameters have either a direct physical significance, or are experimentally determinable. The predictions of the theory are discussed briefly, and several rather general observations are made. However, in view of the complexity inherent in the phenomenon and the present state of inadequate available empirical knowledge regarding this phenomenon, it is not yet possible to make a quantitative comparison between the theory and experiment.

AD-625 775 See Fld. 21/8

AD-626 494 See Fld. 21/8

21/4. FUELS

AD-626 441 Fld. 21/4, 7/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
POSSIBLE CONSTITUENTS OF T-5 FUEL: SYNTHESIS AND PROPERTIES OF ALKYLATED TETRALINS,
by N. I. Shuykin, and N. A. Pozdnyak. 19 Apr 62, 3p. Rept. no. AID-62-52
TT 66-60240
Unclassified report

Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Khimicheskaya, n2 p324-7 1962.

Descriptors: (*Jet engine fuels, Chemical properties), (*Naphthalenes, Alkylation), Alcohols, Polycyclic compounds, USSR

A summary is given of the paper by Shuykin and Pozdnyak which involves the preparation of G-isoalkyl tetralins by the alkylation of tetralins with secondary alcohols. It is thought that such alkylated polycyclics are used as components of the Soviet T-5 jet engine fuel.

21/5. JET AND GAS TURBINE ENGINES

AD-625 783 Fld. 21/5, 20/4
CFSTI Prices: HC $4.00 MF $0.75
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
BASIC STUDIES OF ROTATING STALL AND AN INVESTIGATION OF FLOW-INSTABILITY SENSING DEVICES. PART I. BASIC STUDIES OF ROTATING STALL FLOW MECHANISMS.
Final rept. for Feb 64-Oct 65,
by W. G. Brady, and G. R. Ludwig. Oct 65, 103p. Rept. no. CAL-DF-1901-S-7
Contract AF33 (615)-1240 Proj. AF-3066 Task 306603
AFAPL TR-65-115-PT-1
Unclassified report

Descriptors: (*Turbojet engines, Axial-flow compressors), (*Axial-flow compressors, Stalling), (*Stalling, Vortices), Flow separation, Stability, Flowmeters

The report describes an experimental and analytical investigation of flow processes basic to the problem of rotating stall in axial flow compressors. Boundary-layer studies show that simple analytical treatment of flow separation on a wall moving upstream is not feasible, whereas, partial analytical success was obtained for flow separation on a wall moving down-stream. A stability theory for small disturbances propagating rotationally in the mean swirled flow through a thin annulus with multiple actuators (blade rows) was derived. Comparisons with experimental rotating stall data show fair-to-good agreement of propagation velocities but inaccurate predictions of inception of instability. Additional research is proposed related to lift hysteresis on airfoils in separated flows, time-delay inherent in the leading-edge separation process, and modification and extension of the developed stability theory. (Author)

AD-625 784 Fld. 21/5, 20/4
CFSTI Prices: HC $4.00 MF $0.75
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
BASIC STUDIES OF ROTATING STALL AND AN INVESTIGATION OF FLOW-INSTABILITY SENSING DEVICES. PART II. INVESTIGATION OF FLOW INSTABILITY SENSING DEVICES.
Final rept. Feb 64-Oct 65,
by Ewald F. Schroeder, Roy S. Rice, and Fred Dell'Amico. Oct 65, 110p. Rept. no. CAL-DF-1901-S-7
Contract AF33 (615)-1240 Proj. AF-3066 Task 306603
APL TR-65-115-PT-2
Unclassified report

See also AD-625 783.

Descriptors: (*Turbojet engines, Axial-flow compressors), (*Axial-flow compressors, Stalling), (*Stalling, Flowmeters), Fluid amplifiers, Instrumentation, Tests, Vortices, Stability

The report describes the results of an experimental investigation of pure fluid flow-instability sensing devices that might be applied to the detection of incipient stall in jet-engine compressors. Various sensors employing two-branch probes and bistable fluid amplifiers were investigated. The results of dynamic tests, including operation at high temperatures, are described. The preferred configuration evolved exhibits good performance characteristics and offers a promising solution to pure fluid flow-instability sensing problems. (Author)

AD-625 819 See Fld. 1/3

AD-625 821 See Fld. 1/3

AD-625 823 See Fld. 1/3

21/7. RECIPROCATING ENGINES

AD-625 847 Fld. 21/7, 13/10
CFSTI Prices: HC $1.00 MF $0.50
DEPARTMENT OF THE NAVY WASHINGTON D C
CONDITIONS FOR THE APPLICATION OF AN INDIRECT METHOD OF ESTIMATING THE LOADS OF DIESELS ACCORDING TO FUEL CONSUMPTION AND RPM,
by I. S. Goltraf. 1965, 9p. Rept. no. Translation-2019
TT 66-60155
Unclassified report

Trans. of Sudostroenie (USSR) v31 n6 p24-7 Jun 1965.

Descriptors: (*Diesel engines, Loading (Mechanics)), Mathematical prediction, Shipborne, Fuel oil, Fuel consumption, Operation, USSR, Ship hulls

The complex relationship of the engine loads to the form and condition of the ship's hull, the design and state of the screw propellers, the speed of the ship and the impossibility of successfully simulating certain conditions on the test stand necessitate the conducting of experiments in order to determine the loads of the main engines under on-board conditions.

AD-625 928 See Fld. 11/7

21/8. ROCKET MOTORS AND ENGINES

AD-626 494 Fld. 21/8, 21/2, 20/4
JET PROPULSION CENTER PURDUE UNIV LAFAYETTE IND
INTERACTION OF A WEAK SHOCK WITH A COMBUSTION REGION.
Revised ed.,
by G. M. Lehmann, and S. N. B. Murthy. 10 May 65, 5p. Contract Nonr-1100 (21) Grant ,AF-AFOSR-753-65
AFOSR 65-2495
Unclassified report

Revision of manuscript submitted 1 Apr 1965.

Availability: Published in Journal of Spacecraft and Rockets v2 n5 p828-30 Sep-Oct 1965. Copies to DDC users only.

Descriptors: (*Combustion, Shock waves), (*Shock waves, Combustion chambers), Propagation, Combustion chamber gases, Integration, Numerical analysis, Chemical reactions

The report develops a relation for the propagation of a normal shock through a chemically reactive flowing gas and compares the results obtained with those obtained by numerical integration of the conservation equations with appropriate boundary conditions.

AD-626 430 See Fld. 20/4

21/8.1 LIQUID ROCKET MOTORS

AD-626 273 Fld. 21/8.1
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
MALFUNCTION OF IGNITERS IN THE AMRA VARIABLE PARAMETER ROCKET ENGINE.
Technical note,
by Anthony K. Wong, and James Brown. Jul 65, 19p. Rept. no. AMRA-TN-65-06
Proj. DA-1A022401A110 Task 35844
Unclassified report

See also AD-620 139.

Descriptors: (*Rocket igniters, Malfunctions), (*Rocket motors (Solid propellant), Rocket igniters), Electric wire, Corrosion, Primers

Three firing tests on nozzles were rendered unsatisfactory due to malfunctioning of the pyrotechnic igniters. These igniters were off-the-shelf manufacturer's items. Failure of the igniters was manifested by the leakage of hot gases through the squib end of the igniter body case, followed by complete erosion of that element resulting in a deleterious decrease in chamber pressure and extension of burning time. Although the igniters were several years old, the manufacturer did not believe that aging was the problem. Subsequent examination of the igniters indicated the presence of corrosion of the electrical lead wire immediately adjacent to the ceramic seal enclosing the primer charge. In order to minimize further mishaps, the manufacturer replaced the primer charge unit in all of the igniters remaining on hand. (Author)

21/8.2 SOLID ROCKET MOTORS

AD-625 775 Fld. 21/8.2, 21/2
CFSTI Prices: HC $1.00 MF $0.50
THIOKOL CHEMICAL CORP ELKTON MD
PULSE TESTING OF AN APACHE AND CAJUN SOLID ROCKET MOTOR FOR RESONANCE.
Rept. for Feb-Oct 65,
by John W. Edwards, and John Mallick. 30 Nov 65, 14p. Rept. no. E107-65 ,Scientific-1
Contract AF19 (628)-4068 Proj. AF-P-7659 Task 765904
AFCRL 65-895
Unclassified report

Descriptors: (*Rocket motors (Solid propellant), Captive tests), (*Combustion, Rocket motors (Solid propellant)), Stability, Burning rate, Resonant frequency, Acoustics

The possibility of inducing combustion instability in the Apache and Cajun solid propellant rocket motors was investigated by introducing an acoustic disturbance: pulse tubes loaded with black powder were fired. One Apache and one Cajun rocket motor were tested. The reduced data show that the acoustic disturbances introduced into the motors by the firing of the pulse tubes rapidly dampened out. Since the scope of the testing was limited, it is not possible to conclude absolutely that the Apache or Cajun will never resonate; however, the probability of resonance is very slight. (Author)

21/9.2 SOLID ROCKET PROPELLANTS

AD-625 723 Fld. 21/9.2, 7/2
CFSTI Prices: HC $1.00 MF $0.50
STAUFFER CHEMICAL CO RICHMOND CALIF WESTERN RESEARCH CENTER
HIGH ENERGY OXIDIZERS.
Quarterly technical summary rept. for 1 May-31 Jul 65,
by Karl O. Christe, J. P. Guertin, and A. E. Pavlath. 31 Jul 65, 25p. Contract Nonr-4019 (00) ,ARPA Order 399-62 Proj. NR-093-035
Unclassified report

See also AD-612 661.

Descriptors: (*Solid rocket oxidizers, Fluorochlorides), (*Fluorochlorides, Molecular structure), (*Nitrogen compounds, Fluorochlorides), Ions, Chlorates, Rubidium compounds, Cesium compounds, Solids, Potassium compounds, Solutions, Spectra (Infrared), Electrical conductance, Density, Impurities, Glow discharges, Fluorides, Alkali metal compounds, Complex compounds, X-ray diffraction analysis

Infrared and conductivity measurements show that MClF4 (where M is NO, Rb, or Cs) is ionic in the solid state and in solution, respectively. A square-planar structure (point group D (4h)) is assigned to the ClF4 (-) anion in Rb (+) ClF4 (-) and Cs (+) ClF4 (-). For the ClF4 (-) anion in NO (+) ClF4 (-) the low-temperature infrared measurement indicates a lower symmetry (at least as low as point group D (2h)). A vacuum line, which will enable running glow-discharge reactions at low temperatures and reduced pressures, was designed and built. Density measurements on the alkali metal difluorochlorates (I) indicate that the X-ray patterns given in the preceding Quarterly Report are probably due to small amounts of alkali metal bifluorides, present as impurities. (Author)

AD-626 171 Fld. 21/9.2, 7/2, 19/1
CFSTI Prices: HC $2.00 MF $0.50
PICATINNY ARSENAL DOVER N J AMMUNITION ENGINEERING DIRECTORATE
EVALUATION OF INORGANIC NITRATES AS HEAT TEST STANDARDS. ICRPG WORKING GROUP ON ANALYTICAL CHEMISTRY. ROUND ROBIN NO. 24.
Technical rept.,
by Milton Roth. Dec 65, 46p. Rept. no. TR-3287
Unclassified report

Descriptors: (*Solid rocket propellants, Tests), (*Nitrates, Standards), Aluminum compounds, Copper compounds, Potassium compounds, Iodides, Organic nitrogen compounds, Chemical indicators, Nitrocellulose

Al (NO3)3.9H2O and Cu (NO3)2.3H2O are suitable for use as standards in the potassium iodide and methyl violet heat tests. In addition to being more stable than the organic nitrates currently used as standards, these inorganic nitrates are safer to store and easier to obtain at a prescribed level of purity. Standardization of the heat test can be improved if inorganic nitrates are distributed with the test papers along with a statement of the test time at a given temperature. (Author)

AD-626 187 See Fld. 20/11

AD-626 576 See Fld. 21/2

22/1. ASTRONAUTICS

AD-625 661 Fld. 22/1
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET LONG-RANGE SPACE-EXPLORATION PROGRAM: PART 2, REPORT A.
Analytical survey,
by Vladimir Mutschall. 30 Dec 65, 34p. Rept. no. ATD-65-94
TT 66-60201
Unclassified report

Rept. on Surveys of Communist World Scientific and Technical Literature.

Descriptors: (*Astronautics, USSR), Space flight, Lunar surface vehicles, Astronauts, Space environmental conditions, Space navigation, Interplanetary trajectories, Planetary atmospheres, Power supplies

The report contains a selection of Soviet technical papers and attempts to give the Soviet view of some spaceexploration problems as they existed in mid 1965. The problems treated here are divided into four sections: (1) Interplanetary Space Travel; (2) Lunar Expedition; (3) Power Sources; and (4) Extraterrestrial Contracts.

AD-626 607 Fld. 22/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE AMERICAN AND SOVIET SPACE PROGRAMS,
by Kenneth B. Bley. Jan 66, 8p. Rept. no. P-3294
Unclassified report

Descriptors: (*Space flight, United States), (*United States, Space flight), (*USSR, Space flight), Satellites (Artificial), Manned spacecraft, Space probes, Spacecraft, Meteorological satellites, Communication satellites (Active)

The U. S. is said to be ahead of the USSR in space. The initial U. S. lack of large boosters caused it to 'think small' and resulted in highly sophisticated techniques; as the inbalance was redressed, the same techniques permitted the U. S. to do more with a given weight than the Soviets. More important, however, is what the U. S. has done with the capability now in existence: weather information generated by the satellites; trans-Atlantic telephone calls via satellite; photographs of Mars; effects of weightlessness learned during the flight of Gemini 7. (Text of 15-minute talk given to the Science Club of Beverly Hills High School on Jan. 17, 1966).

22/2. SPACECRAFT

AD-626 044 Fld. 22/2, 4/1
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
BLACK BRANT ROCKETS AID CANADIAN RESEARCH OF UPPER ATMOSPHERE,
by J. H. Craven. 1965, 6p.
NRC 8766
Unclassified report

Availability: Published in Canadian Electronics Engineering, Oct 1965. Copies to DDC users only.

Descriptors: (*Sounding rockets, Canada), (*Atmospheric sounding, Canada), Payload, Instrumentation

AD-626 107 Fld. 22/2, 5/3
RAND CORP SANTA MONICA CALIF
JOINT COST AND PRICE DISCRIMINATION: THE CASE OF COMMUNICATIONS SATELLITES,
by Leland L. Johnson. 1963, 17p. Rept. no. P-2753-1
Unclassified report

Availability: Published in The Journal of Business of the University of Chicago v37 n1 p32-46 Jan 1964. Copies to DDC users only.

Descriptors: (*Communication satellites (Active), Economics), Costs

The purpose of the paper is to examine the nature of the potential conflict in the establishment of a communications satellite system as between economic and political factors and the factors typically encountered in domestic industries after a description of the technology of satellites and institutional arrangements for developing and operating a commercial system, the structure of cost is analyzed. By employment of a theoretical peak-load pricing model, in light of the cost analysis, the problem of efficient pricing for satellites is discussed. It is demonstrated that the enterprise is likely to face serious dilemmas with respect to its pricing policies, given the various objectives set forth in the Communications Satellite Act.

AD-626 304 Fld. 22/2, 20/11
CFSTI Prices: HC $2.00 MF $0.50
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
COMPOSITE MODAL CHARACTERISTICS OF MULTISECTION, ELASTIC SPACE STRUCTURES.
Technical rept. on Solid Mechanics,
by Charles W. Coale. Aug 64, 34p. Rept. no. LRC-65-190
Unclassified report

Descriptors: (*Aerospace craft, Dynamics), (*Dynamics, Aerospace craft), Structural parts, Elasticity, Mathematical analysis

Analysis of the dynamic response of complex structures requries knowledge of the dynamic characteristics of the structure. In many cases a structure is composed of several sections and may be considered to behave linearly. In this report a new method is evolved for analysis of the flexible dynamic characterisitcs of such structures. A matrix eigenvalue equation is derived for determination of the modal characteristics of the composite structure in terms of the characteristics of its sections. Use is made of functional vector modes to describe modal behavior of the sectioons in three-dimensional space. The problem is then formulated in terms of modal and rigid body coordinates of the sections. The eigenvalue equation is derived by application of Lagrange's equations. The connection conditions between sections provide relations between the coordinates. These relations are used to reduce the size of the matrices involved. The method is developed for a tandem series of sections. It may however be extended to multi-branch structures. An essential modification of this analysis is also presented. For many applications a large number of section modes are required for good convergence of the composite modal characteristics. Consideration is therefore given to quasistatic behavior of the sections under the loads applied during composite motion. Additional quasistatic coordinates are introduced into the eq

206-708 O-66—9

envalue analysis yielding a remarkable improvement in convergence in some cases. (Author)

AD-625 873 See Fld. 4/2

AD-625 884 See Fld. 8/4

AD-625 960 See Fld. 4/1

AD-626 199 See Fld. 4/1

AD-626 346 See Fld. 9/2

AD-626 412 See Fld. 9/2

AD-626 442 See Fld. 6/19

AD-626 467 See Fld. 22/3

AD-626 481 See Fld. 15/3

AD-626 526 See Fld. 5/9

AD-626 527 See Fld. 5/9

AD-626 596 See Fld. 6/11

AD-626 610 See Fld. 5/5

AD-626 636 See Fld. 22/3

22/3. SPACECRAFT TRAJECTORIES AND REENTRY

AD-625 882 Fld. 22/3
CFSTI Prices: HC $2.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
TURN OF THE ORBIT'S PLANE OF ARTIFICIAL EARTH SATELLITE,
by Yu. M. Kopnin. Oct 65, 27p. Rept. no. TC-952
TT 66-60165
Unclassified report

K Zadache o Povorote Plokosti Orbity Sputnika. Technical trans. of Kosmicheskie Issledovaniya (USSR) v3 n4 p540-53 1965.

Descriptors: (*Celestial mechanics, Satellites (Artificial)), (*Satellites (Artificial), Celestial mechanics), Trajectories, Equations of motion, Astronautics, USSR

AD-626 005 Fld. 22/3, 20/4, 7/4
CFSTI Prices: HC $1.00 MF $0.50
HELIODYNE CORP LOS ANGELES CALIF
RE-ENTRY PHYSICS RESEARCH.
Final technical summary rept. 12 Jun 64-11 Jun 65,
by Ali Hasan Nayfeh, Andrew P. Proudian, Theodore Azzarelli, W. J. Hooper, and I. R. Tannenbaum. Jun 65, 22p. Contract DA-04-495-AMC-458 (Z) ,ARPA Order-360
Unclassified report

Descriptors: (*Reentry vehicles, Wake), (*Atmosphere entry, Scientific research), Chemical reactions, Stability, Laminar flow, Nonequilibrium flow, Turbulence, Shock waves, Halocarbon plastics, Abstracts, Argon

Studies were performed in the following areas: (a) two-dimensional and axisymmetric laminar wake stability, (b) mixing and chemical reactions in a nonequilibrium turbulent wake, (c) analyses of the properties of schlieren records of turbulent wakes, (d) analyses of molecular transition probabilities in high temperature gas kinetic collisions, (e) analyses of shock wave structure in a particle-gas dispersion, (f) analyses of the rate of burnup of particles behind a moving normal shock wave, (g) development of a powder injection shock tube facility, (h) experimental measurements of the rate of burnup of teflon particles behind a normal shock wave in argon, (i) absorption spectra in shock heated teflon/argon and teflon/nitrogen mixtures, (j) experimental measurements of the electrical conductivity of air and air plus teflon mixtures, and (k) analyses of optical scintillation data from reentry vehicle tests. (Author)

AD-626 278 Fld. 22/3
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON THE PREDICTION OF SATELLITE ORBIT DECAY AND IMPACT,
by Carl Gazley Jr., L. N. Rowell, and G. F. Schilling. Oct 65, 46p. Rept. no. RM-4619-PR
Contract AF49 (638)-700
Unclassified report

Descriptors: (*Orbital trajectories, Life expectancy), Atmosphere models, Programming (Computers), Satellites (Artificial), Impact prediction

Presentation of problems associated with predicting satellite orbit decay plus a description of several computer programs for computing long-term orbit decay, model atmospheres, and final decay and re-entry. Computation of long-term orbit decay using the RAND Satellite Lifetime Program is illustrated for Explorer 9, and the orbit-decay data from the satellite are used to derive a current model atmosphere different from any standard atmospheres and permitting, in subsequent decay computations, a good long-term prediction capability. Computation of final orbit decay with both the Satellite Lifetime Program and the RAND ROCKET Program is then illustrated for the case of Cosmos 5; in this case adjustment of the satellite's ballistic coefficient is used to adjust effectively a model atmosphere to simulate the current atmosphere. (Author)

AD-626 467 Fld. 22/3, 22/2, 17/8
CFSTI Prices: HC $2.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
A STEREOSCOPIC DISPLAY FOR ON-LINE MONITORING OF SIMULATED TERMINAL ENGAGEMENTS.
Technical note,
by W. P. Harris, R. T. Mitchell, M. A. Morfield, A. I. Schulman, and R. A. Wiesen. 3 Dec 65, 27p. Rept. no. TN-1965-58
Contract AF19 (628)-5167 Proj. AF-627A
ESD TDR-65-562
Unclassified report

Descriptors: (*Reentry vehicles, Stereoscopic display systems), (*Stereoscopic display systems, Reentry vehicles), Atmosphere entry, Simulation, Cathode ray tubes, Computers, Interceptor spacecraft

A stereoscoopic, dynamic display of re-entry bodies is described. Information for the display is generated by a simulation program on an IBM 7094 and is fed to a D.E.C. PDP-1 computer. The PDP-1 drives a D.E.C. Type 340 CRT display which is viewed through a special device by a systems analyst. The body of the report gives the philosophy of the need for on-line analysis and a general description of requirements for the display. Appendices give details about the optical viewer, the mathematics of stereoscopic viewing and a set of operational instructions for the display. (Author)

AD-626 636 Fld. 22/3, 22/2
CFSTI Prices: HC $4.00 MF $1.00
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
OPTIMUM DESIGN AND LINEAR GUIDANCE LAW FORMULATION OF ENTRY VEHICLES FOR GUIDANCE PARAMETERS AND TEMPERATURE ACCUMULATION ALONG OPTIMUM ENTRY TRAJECTORIES,
by Roger W. Johnson. Jan 66, 143p. Rept. no. 66-2
Contract AF04 (694)-826
Unclassified report

Descriptors: (*Reentry vehicles, Atmosphere entry), (*Atmosphere entry, Reentry vehicles), (*Terminal guidance, Reentry vehicles), Optimization, Flight control systems, Passive, Servomechanisms, Linear systems, Trajectories, Mathematical models

The objective of this report is to construct a method to simultaneously derive an optimal approximate closed form passive controller (no energy expenditure) and to optimally design a vehicle capable of earth entry. The simultaneous design of the vehicle controller and the configuration is handled by defining a lumped parameter control which contains all parameters of possible passive control and the constants describing the vehicle configuration. The optimal lumped parameter control is found by the 'neighboring optimal' method from the set of controls which satisfy the entry nonlinear differential equations, the set of initial and final state conditions (two point boundary value problem) and a practical bounded control restraint. A technique is described to further partition this discrete point set (in time) of lumped optimal controls into the configuration constants and an optimal approximate closed form polynomial controller using Tchebycheff approximation theory. Finally, a closed loop linear guidance law is derived, using this approximate controller, for a typical entry mission. A new independent monotonic variable is substituted (for the most often used variable, time) into this guidance law to reduce guidance errors due to the differences in time interval between the optimal nominal and the neighboring optimal trajectories.

AD-626 303 See Fld. 4/1

22/4. SPACECRAFT LAUNCH VEHICLES AND GROUND SUPPORT

AD-626 413 Fld. 22/4
CFSTI Prices: HC $2.00 MF $0.50
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF
DETAIL SPECIFICATION FOR ATLAS STANDARD LAUNCH VEHICLE SLV-3 GD/C MODEL 69, ADDENDUM IV,
by J. D. Fitzpatrick. 15 Oct 65, 42p. Rept. no. 69-00200-add-4
Contract AF04 (695)-379 ,AF04 (695-710
Unclassified report

Descriptors: (*Launch vehicles (Aerospace), Specifications), Tables, Military requirements

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

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*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM, AND DYSPROSIUM CONTENTS OF TWO TEKTITES
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* * *
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206-320 O - 66 - 10

*AEROJET- GENERAL CORP AZUSA
CALIF

* * *

TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
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The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C

* * *

65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
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The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

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In certain cases accession numbers are also given with the corresponding AD numbers and TAB locations; for instance, the IDEP (Interservice Data Exchange Program) reports and the CFSTI-TT reports (Technical Translations from the Clearinghouse for Federal Scientific and Technical Information).

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(AFOSR-65-1971)
AD-626 330 FLD. 20/8
(AFOSR-65-1972)
AD-626 331 FLD. 20/8
(AFOSR-65-1973)
AD-626 332 FLD. 20/8

*AF99(638)-1389 GRANT
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
(AFOSR-65-1835)
AD-625 939 FLD. 20/8

*AF99(638)-1395
COLUMBIA UNIV NEW YORK ELECTRONICS RESEARCH LABS
(AFOSR-65-1745)
AD-625 977 FLD. 20/9

*AF99(638)-1402
BELL TELEPHONE LABS INC WHIPPANY N J
(AFOSR-65-2448)
AD-625 969 FLD. 20/14

*AF99(638)-1461
AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC N J
(AFOSR-65-1746)
AD-625 978 FLD. 12/1

*AF99(638)-1468
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
(AFOSR-65-1980)
AD-626 328 FLD. 9/1
(AFOSR-65-1981)
AD-626 329 FLD. 20/3

*AF99(638)-1503
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y
(AFOSR-64-2008)
AD-626 243 FLD. 21/2

*AF99(638)-1509
ASTROMECHANICS RESEARCH DIV GIANNINI CONTROLS CORP MALVERN PA
(AFOSR-65-2214)
AD-626 226 FLD. 13/13

*AF99(638)-1512
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y RESEARCH DEPT
(AFOSR-65-2338)
AD-625 948 FLD. 9/1

*AF99(638)-1700
RAND CORP SANTA MONICA CALIF
RM-3926-1-PR
AD-625 735 FLD. 20/13
RM-4690-PR
AD-626 169 FLD. 12/1
RM-4846-PR
AD-626 205 FLD. 9/1
RM-4977-PR
AD-626 207 FLD. 5/7
RM-4828-PR
AD-626 572 FLD. 5/7

*AF99-992 GRANT
BAKER LAB OF CHEMISTRY CORNELL UNIV ITHACA N Y
(AFOSR-65-2195)
AD-626 514 FLD. 7/3

*AF61(052)-253
CLEVITE CORP BEDFORD OHIO PIEZOELECTRIC DIV
(AFOSR-65-1790)
AD-626 245 FLD. 6/16
(AFOSR-65-1789)
AD-626 259 FLD. 6/16

*AF61(052)-327
ISTITUTO DI AERODINAMICA UNIV OF NAPLES (ITALY)
IA-121
(AFOSR-65-1710)
F AD-625 870 FLD. 20/9

*AF61(052)-672
IONOSPHAREN-INSTITUT BREISACH (GERMANY)
IIB-19A
(AFCRL-65-821)
A AD-626 199 FLD. 9/1

*AF61(052)-754
NATIONAL OBSERVATORY OF ATHENS (GREECE) IONOSPHERIC INST
(AFCRL-65-626)
AD-626 199 FLD. 9/1

*AF61(052)-838
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
TSN-1
(AFCRL-65-782)
AD-626 202 FLD. 7/4

*AF64(052)-484
FORSVARETS FORSKNINGSINSTITUTT KJELLER (NORWAY)
SCIENTIFIC-10
(AFCRL-65-773)
AD-626 197 FLD. 20/14

*AF-AFOSR-25-63
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
(AFOSR-3359)
AD-626 488 FLD. 8/11

*AF-AFOSR-61-32
CATHOLIC UNIV OF AMERICA WASHINGTON D C
AD-626 499 FLD. 12/1

*AF-AFOSR-61-81
CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE
(AFOSR-65-1777)
AD-626 489 FLD. 6/19

*AF-AFOSR-62-95
JOHNS HOPKINS UNIV BALTIMORE MD
(AFOSR-65-1796)
AD-626 485 FLD. 12/1

*AF-AFOSR-62-96
MARYLAND UNIV COLLEGE PARK
(AFOSR-65-1760)
AD-625 774 FLD. 20/12

*AF-AFOSR-62-68
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
(AFOSR-65-1002)
AD-626 346 FLD. 9/2
(AFOSR-65-1001)
AD-626 510 FLD. 12/2

*AF-AFOSR-62-165
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
(AFOSR-65-2398)
AD-625 772 FLD. 20/6

*AF-AFOSR-62-295
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF ELECTROPHYSICS
(AFOSR-65-2400)
AD-625 768 FLD. 9/5

*AF-AFOSR-62-400
NEW SOUTH WALES UNIV KENSINGTON (AUSTRALIA) DEPT OF APPLIED MATHEMATICS
(AFOSR-65-1750)
AD-625 770 FLD. 12/1

*AF-AFOSR-62-410
FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)
(AFOSR-65-1809)
AD-625 767 FLD. 20/8

*AF-AFOSR-62-412
WAYMAN CROW LAB OF PHYSICS WASHINGTON UNIV ST LOUIS MO
(AFOSR-65-1810)
AD-625 682 FLD. 20/8

*AF-AFOSR-62-422
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
(AFOSR-65-1751)
AD-625 679 FLD. 4/1
(AFOSR-65-1878)
AD-626 097 FLD. 4/1

*AF-AFOSR-62-453
ARCTIC INST OF NORTH AMERICA MONTREAL (QUEBEC)
AD-625 677 FLD. 8/11

*AF-AFOSR-76-63
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES
(AFOSR-65-1898)
AD-625 875 FLD. 20/12

*AF-AFOSR-107-64
CHARGED PARTICLE RESEARCH LAB UNIV OF ILLINOIS URBANA
(AFOSR-65-2496)
AD-626 521 FLD. 14/2

*AF-AFOSR-130-63
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
(AFOSR-65-2189)
AD-625 930 FLD. 20/3

*AF-AFOSR-139-63
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
ERL-65-29
AD-626 296 FLD. 9/1

*AF-AFOSR-139-64
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
(AFOSR-65-2447)
AD-625 708 FLD. 9/1

*AF-AFOSR-142-63
BAKER LAB OF CHEMISTRY CORNELL UNIV ITHACA N Y
(AFOSR-65-2196)
AD-626 511 FLD. 7/3
(AFOSR-65-2195)
AD-626 514 FLD. 7/3

*AF-AFOSR-148-63
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
(AFOSR-65-1901)
AD-626 080 FLD. 20/12
(AFOSR-65-1902)
AD-626 081 FLD. 20/12
(AFOSR-65-1900)
AD-626 082 FLD. 20/12
(AFOSR-65-1899)
AD-626 908 FLD. 20/12

*AF-AFOSR-151-63
FRICK CHEMICAL LAB PRINCETON UNIV N J
(AFOSR-65-2197)
AD-625 678 FLD. 9/3

*AF-AFOSR-156-63
FLUID DYNAMICS RESEARCH LAB MASS INST OF TECH CAMBRIDGE
65-2
(AFOSR-65-1932)
F AD-626 058 FLD. 20/4

*AF-AFOSR-191-63
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
(AFOSR-65-1965)
AD-626 901 FLD. 7/4

•AF-AFOSR-220-63
KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
(AFOSR-65-1913)
F AD-626 137 FLD. 7/2

•AF-AFOSR-299-63
STERLING CHEMISTRY LAB YALE UNIV NEW HAVEN CONN
(AFOSR-65-2382)
AD-626 519 FLD. 7/4
(AFOSR-65-2381)
AD-626 520 FLD. 7/4

•AF-AFOSR-296-63
CALIFORNIA UNIV LOS ANGELES BRAIN RESEARCH INST
(AFOSR-65-1778)
AD-626 507 FLD. 6/5

•AF-AFOSR-269-63
NEW MEXICO UNIV ALBUQUERQUE DEPT OF CHEMISTRY
(AFOSR-65-2386)
AD-626 517 FLD. 7/5

•AF-AFOSR-271-63
STATE UNIV OF NEW YORK BUFFALO DEPT OF CHEMISTRY
(AFOSR-65-1939)
F AD-626 156 FLD. 7/4

•AF-AFOSR-309-63
FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)
(AFOSR-65-1812)
AD-626 487 FLD. 20/8
(AFOSR-65-1955)
AD-626 506 FLD. 4/1

•AF-AFOSR-323-63
MICROWAVE LAB STANFORD UNIV CALIF
ML-1286
(AFOSR-65-1957)
AD-626 518 FLD. 20/5

•AF-AFOSR-329-63
CORNELL UNIV ITHACA N Y
(AFOSR-65-1961)
AD-626 515 FLD. 20/8

•AF-AFOSR-331-63
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
(AFOSR-65-1877)
AD-626 096 FLD. 4/1
(AFOSR-65-1878)
AD-626 097 FLD. 4/1
(AFOSR-65-1881)
AD-626 098 FLD. 4/1
(AFOSR-65-1882)
AD-626 099 FLD. 4/1
(AFOSR-65-1879)
AD-626 502 FLD. 4/1
(AFOSR-65-1880)
AD-626 503 FLD. 4/1

•AF-AFOSR-351-63
CALIFORNIA UNIV RIVERSIDE
(AFOSR-65-1797)
AD-626 509 FLD. 12/1

•AF-AFOSR-385-63
BOSTON UNIV MASS DEPT OF PHYSICS
(AFOSR-65-1870)
AD-626 512 FLD. 20/8
(AFOSR-65-1869)
AD-626 513 FLD. 20/8

•AF-AFOSR-418-63
SOUTHERN METHODIST UNIV DALLAS TEX DEPT OF GEOLOGY AND GEOPHYSICS
AD-625 763 FLD. 8/7

•AF-AFOSR-418-65
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF GEOLOGY AND GEOPHYSICS
AD-626 113 FLD. 8/7

•AF-AFOSR-422-62
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
(AFOSR-65-1792)
AD-626 491 FLD. 4/1
(AFOSR-65-1789)
AD-626 492 FLD. 4/1

•AF-AFOSR-430-63
MICHIGAN STATE UNIV EAST LANSING
(AFOSR-65-1962)
AD-626 504 FLD. 7/4

•AF-AFOSR-437-63
CATHOLIC UNIV OF AMERICA WASHINGTON D C
(AFOSR-65-1963)
AD-626 386 FLD. 12/1

•AF-AFOSR-444-64
NORTH CAROLINA STATE UNIV RALEIGH APPLIED MATHEMATICS RESEARCH GROUP
PSR-24/7
(AFOSR-65-1906)
AD-626 055 FLD. 20/11

•AF-AFOSR-459-63
CALIFORNIA UNIV LOS ANGELES
(AFOSR-65-1964)
AD-626 505 FLD. 12/1

•AF-AFOSR-496-65
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING
(AFOSR-65-2399)
AD-625 876 FLD. 11/6

•AF AFOSR-500-64
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
(AFOSR-65-1816)
AD-626 060 FLD. 20/10
(AFOSR-65-1819)
AD-626 484 FLD. 20/8

•AF-AFOSR-566-64
CATHOLIC UNIV OF AMERICA WASHINGTON D C
(AFOSR-65-1821)
AD-625 681 FLD. 20/8

•AF-AFOSR-580-64
MELLON INST PITTSBURGH PA
(AFOSR-65-2390)
AD-626 522 FLD. 7/2

•AF-AFOSR-594-64
WASHINGTON UNIV SEATTLE
(AFOSR-65-1966)
AD-626 525 FLD. 20/8

•AF-AFOSR-602-64
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
(AFOSR-65-2395)
AD-625 931 FLD. 7/4

•AF-AFOSR-611-64
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY
(AFOSR-65-1967)
AD-626 495 FLD. 20/2

•AF-AFOSR-650-64
CALIFORNIA UNIV SAN DIEGO
(AFOSR-65-1808)
AD-625 683 FLD. 20/6

•AF-AFOSR-710-64
CALIFORNIA UNIV LOS ANGELES INST OF GEOPHYSICS AND PLANETARY PHYSICS
AD-625 684 FLD. 8/11

•AF-AFOSR-753-65
JET PROPULSION CENTER PURDUE UNIV LAFAYETTE IND
(AFOSR-65-2495)
AD-626 494 FLD. 21/8

•AF-AFOSR-816-65
BELFER GRADUATE SCHOOL OF SCIENCE YESHIVA UNIV NEW YORK
(AFOSR-65-1874)
AD-626 100 FLD. 20/10

•AF-AFOSR-853-65
WESTERN AUSTRALIA UNIV PERTH
(AFOSR-65-2090)
AD-626 916 FLD. 20/2

•AF-AFOSR-859-65
RICE UNIV HOUSTON TEX DEPT OF SPACE SCIENCE
(AFOSR-65-1829)
AD-625 688 FLD. 3/2

•AF-EOAR-2-63
UNIVERSITY COLL LONDON (ENGLAND) DEPT OF ANATOMY
(AFOSR-65-1788)
AD-625 707 FLD. 6/3

•AF-EOAR-26-64
SOCIETE FRANCAISE DE PHYSIQUE PARIS
(AFOSR-65-0722)
AD-626 131 FLD. 20/12
(AFOSR-65-0723)
AD-626 132 FLD. 20/9
(AFOSR-65-0724)
AD-626 133 FLD. 20/12
(AFOSR-65-0725)
AD-626 134 FLD. 20/12

•AF-EOAR-27-63
MILAN UNIV (ITALY) ISTITUTO DI FISICA
(AFOSR-65-1893)
AD-625 705 FLD. 20/12
(AFOSR-65-1784)
AD-626 353 FLD. 20/12

•AF-EOAR-31-63
HULL UNIV (ENGLAND) DEPT OF CHEMISTRY
(AFOSR-65-1909)
F AD-626 059 FLD. 7/4

•AF-EOAR-35-64
LUND UNIV (SWEDEN) DEPT OF PHYSICS
(AFOSR-65-1895)
AD-625 701 FLD. 4/1
(AFOSR-65-1844)
AD-625 702 FLD. 4/1

•AF-EOAR-36-65
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
(AFOSR-65-1846)
AD-626 108 FLD. 20/8

•AF-EOAR-39-64
TORINO UNIV (ITALY) ISTITUTO DI FISICA
(AFOSR-65-1848)
AD-625 697 FLD. 20/8
AD-625 698 FLD. 20/10
AD-625 699 FLD. 20/10
(AFOSR-65-1851)
AD-625 700 FLD. 20/8
(AFOSR-65-1847)
AD-626 093 FLD. 20/10

•AF-EOAR-46-64
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND)
(AFOSR-65-1856)
AD-626 498 FLD. 20/8
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
(AFOSR-65-1855)
AD-626 335 FLD. 20/8
(AFOSR-65-1861)
AD-626 336 FLD. 20/8
(AFOSR-65-1857)
AD-626 337 FLD. 20/8
(AFOSR-65-1858)

AD-626 338 FLD. 20/8
AD-626 339 FLD. 20/8
(AFOSR-65-1862)
AD-626 340 FLD. 20/8
(AFOSR-65-1859)
AD-626 341 FLD. 20/8
(AFOSR-65-1859)
AD-626 342 FLD. 20/8
(AFOSR-65-1852)
AD-626 343 FLD. 20/8
(AFOSR-65-1894)
AD-626 345 FLD. 20/8

*AF-EOAR-83-63
UPPSALA UNIV (SWEDEN) DEPT OF PHYSICS
(AFOSR-65-1894)
AD-626 099 FLD. 20/2

*AF-EOAR-83-64
TECHNISCHE HOCHSCHULE MUNICH (WEST GERMANY) INSTITUT FUER ANGEWANDTE BOTANIK
(AFOSR-65-2722)
F AD-626 057 FLD. 6/3

*AF-EOAR-62-87
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND)
(AFOSR-65-1781)
AD-626 333 FLD. 20/8
JOHNS HOPKINS UNIV BALTIMORE MD
(AFOSR-65-1780)
AD-626 334 FLD. 20/8

*AF-EOAR-62-79
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
(AFOSR-65-1866)
AD-626 359 FLD. 20/10

*AF-EOAR-64-29
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS
(AFOSR-65-1764)
AD-626 350 FLD. 20/8

*AF-EOAR-71-63
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF PHYSICS
(AFOSR-65-1895)
AD-625 709 FLD. 20/3

*AF-EOAR-75-63
DURHAM UNIV (ENGLAND) DEPT OF PHYSICS
(AFOSR-65-1896)
AD-626 363 FLD. 20/12

*AF-EOAR-78-64
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
TAE-41
(AFOSR-65-1798)
A AD-625 938 FLD. 20/9

*AF-EOAR-79-63
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
(AFOSR-65-1865)
AD-626 104 FLD. 20/8
(AFOSR-65-1797)
AD-626 356 FLD. 20/8

*AF-EOAR-80-63
UNIVERSITY COLL DUBLIN (EIRE)
(AFOSR-65-1840)
AD-626 092 FLD. 3/2

*AF-EOAR-87-63
NATIONAL ELECTROTECHNICAL INST TURIN (ITALY)
(AFOSR-65-1897)
AD-625 709 FLD. 7/4

*AF-EOAR-98-63
POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA
SCIENTIFIC-4
(AFOSR-65-2186)
AD-626 347 FLD. 20/4
SCIENTIFIC-5
(AFOSR-65-2185)
AD-626 349 FLD. 20/4

*AF-EOAR-100-63
OSLO UNIV (NORWAY) INST OF PHYSICS
(AFOSR-65-1912)
F AD-626 056 FLD. 20/8
(AFOSR-65-1891)
AD-626 095 FLD. 20/8

*ARPA ORDER-104
DATA ANALYSIS AND TECHNIQUE DEVELOPMENT CENTER UNITED ELECTRODYNAMICS INC ALEXANDRIA VA
DATDC-28
AD-626 380 FLD. 17/10
DATDC-34
AD-626 382 FLD. 17/10

*ARPA ORDER-104-60
GEOTECHNICAL CORP GARLAND TEX
TR-65-28
AD-626 906 FLD. 8/11
TR-64-133
AD-626 928 FLD. 8/11
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
SR-7
AD-626 907 FLD. 8/11
SR-8
AD-626 908 FLD. 17/10

*ARPA ORDER-125
CALIFORNIA UNIV SANTA BARBARA
TR-14
AD-626 556 FLD. 7/4
TR-15
AD-626 557 FLD. 7/4
CALIFORNIA UNIV SANTA BARBARA DEPT OF PHYSICS
TR-12
AD-626 649 FLD. 20/12

*ARPA ORDER 270-62
ARECIBO IONOSPHERIC OBSERVATORY PUERTO RICO
(AFOSR-65-1765)
AD-625 980 FLD. 3/2

*ARPA ORDER-273
AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF
U-3200
AD-626 316 FLD. 7/4

*ARPA ORDER-292
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
LGO-814
(AFCRL-65-793)
AD-625 926 FLD. 8/11
RESEARCH TRIANGLE INST DURHAM N C
AD-625 966 FLD. 8/11

*ARPA ORDER-292-62
ARCTIC INST OF NORTH AMERICA MONTREAL (QUEBEC)
AD-625 677 FLD. 8/11

*ARPA ORDER-299
AMERICAN CYANAMID CO STAMFORD CONN CENTRAL RESEARCH DIV
06-1932-29-010
AD-626 295 FLD. 7/5

*ARPA ORDER-306
HUGHES AIRCRAFT CO CULVER CITY CALIF AEROSPACE GROUP
AD-625 899 FLD. 20/5

*ARPA ORDER-306-36
POLYTECHNIC INST OF BROOKLYN N Y
F AD-626 319 FLD. 20/5

*ARPA ORDER-360
HELIODYNE CORP LOS ANGELES CALIF
F AD-626 005 FLD. 22/3

*ARPA ORDER-362
DENVER UNIV COLO DEPT OF PHYSICS
SCIENTIFIC-1
(AFCRL-65-884)
AD-626 632 FLD. 4/1

*ARPA ORDER-388
RAYTHEON CO BURLINGTON MASS MICROWAVE AND POWER TUBE DIV
F AD-626 477 FLD. 9/1

*ARPA ORDER-399
TRACOR INC AUSTIN TEX
TRACOR-66-104-U
AD-626 211 FLD. 7/2

*ARPA ORDER 399-62
STAUFFER CHEMICAL CO RICHMOND CALIF WESTERN RESEARCH CENTER
S AD-625 729 FLD. 21/9.2

*ARPA ORDER-912
LINCOLN LAB MASS INST OF TECH LEXINGTON
TR-1965-62
(ESD-TDR-65-564)
AD-625 817 FLD. 8/11
TN-1965-57
(ESD-TDR-65-586)
AD-626 180 FLD. 8/11

*ARPA ORDER 942
RIAS INC BALTIMORE MD
AD-626 184 FLD. 7/2

*ARPA ORDER-996
MITRE CORP BEDFORD MASS
MTP-3
(ESD-TR-65-116)
AD-625 738 FLD. 9/5

*ARPA ORDER-999
TELEDYNE INDUSTRIES INC BILLINGS MONT EARTH SCIENCES DIV
616-1265-2065
AD-626 924 FLD. 8/11

*ARPA ORDER-629
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
TR-65-124
AD-626 529 FLD. 8/11

*AT(04-3)-63
CALIFORNIA INST OF TECH PASADENA
AD-626 454 FLD. 20/10

*AT(11-1)-34 GRANT
INSTITUTE OF MARINE RESOURCES UNIV OF CALIFORNIA LA JOLLA
AD-625 986 FLD. 8/1

*AT(30-1)-2174
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-626 575 FLD. 8/10

*AT(30-1)-3010
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
REF-65-64
AD-626 011 FLD. 8/7

*AT(30-1)-3226 GRANT
CORNELL UNIV ITHACA N Y
(AFOSR-65-1961)
AD-626 515 FLD. 20/8

*AT(49-5)-2110
NAVAL RESEARCH LAB WASHINGTON D C
NRL-1663
AD-626 466 FLD. 18/10

*AT(49-7)-1963
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
USNRDL-TR-933
AD-626 608 FLD. 18/8

•CRD-AA-L-P-3932
NATIONAL BUREAU OF STANDARDS
WASHINGTON D C
(AROD-3932:8)
F AD-625 772 FLD. 12/1

•DA-01-021-AMC-12727(Z)
HELIODYNE CORP LOS ANGELES CALIF
AD-625 887 FLD. 9/1

•DA-04-495-AMC-498(Z)
HELIODYNE CORP LOS ANGELES CALIF
F AD-626 005 FLD. 22/3

•DA-11-070-AMC-481(M)
IIT RESEARCH INST CHICAGO ILL
TECHNOLOGY CENTER
IITRI-C6032-17
F AD-626 186 FLD. 11/6

•DA-11-070-AMC-628(M)
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF INDUSTRIAL ENGINEERING
F AD-625 872 FLD. 13/9

•DA-18-039-AMC-135(A)
PRIMATE LAB UNIV OF WISCONSIN MADISON
AD-625 961 FLD. 6/15

•DA-18-064-AMC-375(A)
INSTITUTE OF CONTEMPORARY RUSSIAN STUDIES FORDHAM UNIV NEW YORK
AD-626 476 FLD. 6/13

•DA-18-064-CML-2832
MINNESOTA UNIV ST PAUL DEPT OF PLANT PATHOLOGY AND PHYSIOLOGY
AD-626 483 FLD. 6/3

•DA-19-020-AMC-0231(X)
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF METALLURGY
(AMRA-CR-64-07/2)
AD-626 225 FLD. 11/6

•DA-19-020-AMC-5753(Z)
MASSACHUSETTS INST OF TECH
CAMBRIDGE
(WAL-TR-311/60)
F AD-626 601 FLD. 13/8

•DA-19-020-ORD-5294
YALE UNIV NEW HAVEN CONN
AD-626 355 FLD. 12/1

•DA-19-020-ORD-5294 GRANT
YALE UNIV NEW HAVEN CONN
AD-626 354 FLD. 12/1

•DA-19-020-ORD-5482
SYLVANIA ELECTRONIC SYSTEMS
WALTHAM MASS APPLIED RESEARCH LAB
F-1017-2
F AD-625 892 FLD. 20/6

•DA-19-129-AMC-163(N)
FMC CORP SANTA CLARA CALIF
CENTRAL ENGINEERING LABS
F AD-626 193 FLD. 6/8

•DA-19-129-AMC-254(N)
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
F AD-626 176 FLD. 6/8

•DA-19-129-QM-1790
VISKING CO CHICAGO ILL
AD-626 178 FLD. 6/8

•DA-19-129-QM-1926
COLORADO UNIV BOULDER
AD-625 935 FLD. 7/3

•DA-22-079-ENG-134
PURDUE UNIV LAFAYETTE IND
ENGINEERING EXPERIMENT STATION
AD-626 900 FLD. 8/6

•DA-22-079-ENG-288
MASSACHUSETTS INST OF TECH
CAMBRIDGE SOIL MECHANICS DIV
RR-R65-17
AD-625 942 FLD. 8/13

•DA-22-079-ENG-330
MASSACHUSETTS INST OF TECH
CAMBRIDGE SOIL MECHANICS DIV
RR-R65-09
(AEWES-3-101)
AD-625 871 FLD. 8/13

•DA-22-079-ENG-435
REPUBLIC AVIATION CORP FARMINGDALE N Y
C-6091-05
(AEWES-3-123)
AD-626 617 FLD. 1/5

•DA-23-072-ORD-1674
SOUTHWEST RESEARCH INST SAN ANTONIO TEX DEPT OF MECHANICAL SCIENCES
(AROD-3134:5)
AD-626 239 FLD. 11/6

•DA-28-043-AMC-00032(E)
ILLINOIS STATE WATER SURVEY URBANA
AD-626 325 FLD. 4/2

•DA-28-043-AMC-00109(E)
TEXAS INSTRUMENTS INC DALLAS
SEMICONDUCTOR-COMPONENTS DIV
TI-03-65-108
AD-625 766 FLD. 9/5

•DA-28-043-AMC-00130(E)
STANFORD RESEARCH INST MENLO PARK CALIF
F AD-625 771 FLD. 4/2

•DA-28-043-AMC-00183(E)
BROWN UNIV PROVIDENCE R I
AD-626 594 FLD. 4/1

•DA-28-043-AMC-00257(E)
CBS LABS STAMFORD CONN
AD-626 618 FLD. 17/2

•DA-28-043-AMC-00306(E)
CORNELL AERONAUTICAL LAB INC
BUFFALO N Y
CAL-VC-1967-P-2
F AD-625 739 FLD. 4/2

•DA-28-043-AMC-00379(E)
ELECTRONIC DEFENSE LABS SYLVANIA
ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
EDL-M904
AD-626 089 FLD. 17/3
EDL-M794
AD-626 592 FLD. 17/9

•DA-28-043-AMC-00452(E)
BOEING CO SEATTLE WASH AEROSPACE GROUP
AD-626 192 FLD. 14/3

•DA-28-043-AMC-01219(E)
TRAVELERS RESEARCH CENTER INC
HARTFORD CONN
7469-178
(ECOM-01219-8)
AD-625 689 FLD. 9/2

•DA-28-043-AMC-01223(E)
ELECTRONIC ASSOCIATES INC LONG BRANCH N J
AD-625 730 FLD. 17/2

•DA-28-043-AMC-01236(E)
MARTIN CO ORLANDO FLA
OR-6791
AD-625 958 FLD. 9/5

•DA-28-043-AMC-01257(E)
ILLINOIS STATE WATER SURVEY URBANA
ATMOSPHERIC SCIENCES SECTION
AD-625 760 FLD. 4/2

•DA-28-043-AMC-01315(E)
MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
AD-626 196 FLD. 20/14

•DA-28-043-AMC-01328(E)
REEVES-HOFFMAN DIV DYNAMICS CORP OF AMERICA CARLISLE PA
AD-626 181 FLD. 9/1

•DA-28-043-AMC-01371(E)
TEXAS INSTRUMENTS INC DALLAS
SEMICONDUCTOR-COMPONENTS DIV
TI-03-65-106
AD-626 379 FLD. 9/1

•DA-28-043-AMC-01412(E)
GENERAL ATOMIC SAN DIEGO CALIF
GA-6715
(ECOM-01412-1)
AD-626 479 FLD. 18/8

•DA-28-043-AMC-01445(E)
BELL TELEPHONE LABS INC MURRAY HILL N J
22
(ECOM-01445-22)
AD-626 469 FLD. 9/1

•DA-28-043-AMC-01514(E)
VARIAN ASSOCIATES PALO ALTO CALIF
AD-626 219 FLD. 9/1

•DA-31-124-ARO (D)-51
FLORIDA UNIV GAINESVILLE
METALLURGICAL RESEARCH LAB
F AD-625 829 FLD. 11/6

•DA-31-124-ARO(D)-54
SHELL DEVELOPMENT CO EMERYVILLE CALIF
(AROD-4133:12)
AD-625 693 FLD. 7/9

•DA-31-124-ARO(D)-67
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF ENGINEERING MECHANICS
(AROD-3842:6)
AD-625 696 FLD. 20/11

•DA-31-124-ARO(D)-83
STANFORD RESEARCH INST MENLO PARK CALIF
(AROD-3251:4)
AD-626 377 FLD. 20/8

•DA-31-124-ARO(D)-98 GRANT
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
66-13
(AROD-4166:7)
AD-626 472 FLD. 9/7

•DA-31-124-ARO(D)-102
CALIFORNIA INST OF TECH PASADENA
DIV OF CHEMISTRY AND CHEMICAL ENGINEERING
(AROD-3906:10)
AD-625 982 FLD. 7/9

•DA-31-124-ARO(D)-144
NORTHWESTERN UNIV EVANSTON ILL
(AROD-4489:3)
AD-626 238 FLD. 12/1
(AROD-4489:1)
AD-626 237 FLD. 12/1

•DA-31-124-ARO(D)-152
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF CHEMISTRY
(AROD-2819:8)
AD-625 703 FLD. 7/3

•DA-31-124-ARO(D)-169 GRANT
RESEARCH TRIANGLE INST DURHAM N C
(AROD-3918:2)
F AD-625 934 FLD. 7/5

•DA-31-124-ARO(D)-172

206-320 O - 66 - 18

VERMONT UNIV BURLINGTON DEPT OF PHYSICS
(AROD-4403:5)
AD-626 231 FLD. 20/9

•DA-31-124-ARO-D-203
RIAS INC BALTIMORE MD
AD-626 184 FLD. 7/2

•DA-31-124-ARO(D)-208
MICROWAVE LAB STANFORD UNIV CALIF
ML-1389
(AROD-3780:3)
AD-626 400 FLD. 20/2

•DA-31-124-ARO(D)-257
CALIFORNIA UNIV LA JOLLA DEPT OF PHYSICS
(AROD-5133:26)
AD-626 369 FLD. 20/2

•DA-31-124-ARO(D)-273
SOUTHWEST RESEARCH INST SAN ANTONIO TEX DEPT OF MECHANICAL SCIENCES
(AROD-3134:5)
AD-626 239 FLD. 11/6

•DA-31-124-ARO(D)-282
TEXAS A AND M UNIV COLLEGE STATION
(AROD-4721:2)
AD-626 486 FLD. 12/2

•DA-31-124-ARO(D)-355
CALIFORNIA UNIV LOS ANGELES DEPT OF MATHEMATICS
(AROD-5863:2)
AD-626 395 FLD. 12/2

•DA-31-124-ARO(D)-359
ILLINOIS UNIV URBANA DEPT OF PHYSICS
(AROD-2771:10)
AD-625 711 FLD. 20/12

•DA-33-017-ENG-180
ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING
AD-626 583 FLD. 13/8
AD-626 599 FLD. 13/8

•DA-36-039-AMC-02988
DREXEL DYNAMICS CORP HORSHAM PA
REP-2630-3300
F AD-625 911 FLD. 19/1

•DA-36-039-ORD-3576-RD
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF ENGINEERING MECHANICS
AD-626 541 FLD. 19/9

•DA-36-038-AMC-1789(A)
AMERICAN POWER JET CO RIDGEFIELD N J
APJ-415-1
(FA-R-1793)
F AD-626 922 FLD. 13/5

•DA-36-039-AMC-03221(E)
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-625 672 FLD. 7/4

•DA-36-039-AMC-03252E
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
8209-1 ML-65357
AD-626 198 FLD. 9/1

•DA-36-039-AMC-02164(E)
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
AD-626 183 FLD. 9/5

•DA-36-039-AMC-02164(E) GRANT
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
(AFOSR-65-2947)
AD-625 708 FLD. 9/1
ERL-65-29

AD-626 296 FLD. 9/1

•DA-36-039-AMC-02229(E)
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METEOROLOGY
F AD-625 969 FLD. 4/2

•DA-36-039-AMC-02294(E)
GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION
30
(ECOM-02294-9)
AD-626 921 FLD. 17/2.1

•DA-36-039-AMC-02300(E)
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 369 FLD. 5/7

•DA-36-039-AMC-03187(E)
MICROWAVE ASSOCIATES INC BURLINGTON MASS
8
F AD-626 637 FLD. 9/1

•DA-36-039-AMC-03200(E)
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-625 671 FLD. 20/3
AD-626 021 FLD. 20/4
AD-626 357 FLD. 20/6
AD-626 358 FLD. 14/2
AD-626 365 FLD. 7/4
AD-626 367 FLD. 5/10

•DA-36-039-AMC-03200(E) GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-625 673 FLD. 9/5
AD-625 674 FLD. 20/3
AD-626 362 FLD. 9/1

•DA-36-039-AMC-03200 GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 361 FLD. 20/12
AD-626 366 FLD. 6/16

•DA-36-039-AMC-03404(E)
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
EDL-M795
AD-626 088 FLD. 9/5

•DA-36-039-AMC-03617(E)
WESTINGHOUSE ELECTRIC CORP PHILADELPHIA PA
F AD-626 182 FLD. 9/1

•DA-36-039-AMC-03638(E)
PIEZO CRYSTAL CO CARLISLE PA
AD-625 890 FLD. 9/1

•DA-36-039-AMC-03640(E)
BLILEY ELECTRIC CO ERIE PA
AD-626 433 FLD. 9/1

•DA-36-039-AMC-03643(E)
RADIO CORP OF AMERICA MOUNTAINTOP PA ELECTRONIC COMPONENTS AND DEVICES
AD-626 437 FLD. 9/1

•DA-36-039-AMC-06157(E)
GENERAL ELECTRIC CO AUBURN N Y SEMICONDUCTOR PRODUCTS DEPT
AD-626 419 FLD. 9/1

•DA-36-039-AMC-06159(E)
SYLVANIA ELECTRIC PRODUCTS INC WOBURN MASS SEMICONDUCTOR DIV
AD-625 755 FLD. 9/1
AD-625 756 FLD. 9/1

•DA-36-039-AMC-06165(E)
GENERAL ELECTRIC CO HUDSON FALLS N Y CAPACITOR DEPT
AD-626 375 FLD. 11/9

•DA-36-039-AMC-06168(E)
LINDE DIV UNION CARBIDE CORP EAST CHICAGO IND
AD-626 212 FLD. 20/5

•DA-36-039-SC-92632
VICTORY ENGINEERING CORP SPRINGFIELD N J
AD-626 062 FLD. 14/2

•DA-36-039-SC-56695
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
I-92
AD-625 706 FLD. 20/8

•DA-36-039-SC-86719(E)
BLILEY ELECTRIC CO ERIE PA
F AD-625 831 FLD. 9/1

•DA-44-009-AMC-910(T)
TYCO LABS INC WALTHAM MASS
AD-626 420 FLD. 10/2

•DA-44-009-AMC-967(T)
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN
PWA-2678-VOL-1
AD-626 434 FLD. 10/2
PWA-2678-VOL-2
AD-626 435 FLD. 10/2

•DA-44-177-AMC-25(T)
HILLER AIRCRAFT CORP PALO ALTO CALIF
ER-64-41
(USAAVLABS-TR-64-68A)
S AD-625 818 FLD. 1/3
ER-64-42
(USAAVLABS-TR-64-68B)
AD-625 819 FLD. 1/3
ER-64-45
(USAAVLABS-TR-64-68E)
AD-625 820 FLD. 1/3
ER-64-49
(USAAVLABS-TR-64-68I)
AD-625 821 FLD. 1/3
ER-64-50
(USAAVLABS-TR-64-68J)
AD-625 822 FLD. 1/3
AD-625 823 FLD. 1/3

•DA-44-188-ARO-2
HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA
TR-65-14
AD-626 262 FLD. 9/7

•DA-44-129-ENG-317
AMMANN AND WHITNEY NEW YORK
AD-625 752 FLD. 13/13
AD-625 753 FLD. 13/13

•DA-44-146-XZ-288
UNITED RESEARCH SERVICES CORP BURLINGAME CALIF
URS-645-8
(DASA-1718)
F AD-625 732 FLD. 13/13

•DA-44-193-MD-2272
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
A AD-625 917 FLD. 6/16

•DA-44-193-MD-2557 GRANT
BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE
AD-625 675 FLD. 6/5

•DA-44-193-MD-2434 GRANT
PUERTO RICO UNIV SAN JUAN SCHOOL OF MEDICINE
AD-626 370 FLD. 6/3

•DA-44-193-MD-2627
KENT STATE UNIV OHIO
AD-626 368 FLD. 6/3

•DA-91-591-EUC-2915
GENOA UNIV (ITALY) ISTITUTO

GEOFISICO E GEODETICO
F AD-626 373 FLD. 4/2

•DA-92-557-FEC-35637
KEIO UNIV TOKYO (JAPAN) SCHOOL OF MEDICINE
AD-625 835 FLD. 6/15

•DA-92-557-FEC-36882
HIROSHIMA UNIV (JAPAN) SCHOOL OF MEDICINE
S AD-625 841 FLD. 6/16

•DA-92-557-FEC-37308
TOKYO UNIV (JAPAN) SCHOOL OF MEDICINE
(ARDG(FE)-J-188)
AD-625 842 FLD. 6/5

•DA-92-557-FEC-37351
HOKKAIDO UNIV SAPPORO (JAPAN) SCHOOL OF MEDICINE
(ARDG(FE)-J-200)
AD-625 843 FLD. 6/1

•DA-92-557-FEC-37370
KUMAMOTO UNIV (JAPAN) MEDICAL SCHOOL
(ARDG(FE)-J-196)
AD-625 848 FLD. 6/1

•DA-92-557-FEC-37427
NARA MEDICAL COLL KASHIHARA CITY (JAPAN) DEPT OF PHYSIOLOGY
(ARDG(FE)-J-207)
AD-625 849 FLD. 6/16

•DA-ARO(D)-31-124-G40
CALIFORNIA UNIV LOS ANGELES
(AROD-1517:82)
AD-626 550 FLD. 12/1
(AROD-1517:96)
AD-626 551 FLD. 12/1

•DA-ARO(D)-31-124-G146
PURDUE UNIV LAFAYETTE IND DEPT OF CHEMISTRY
(AROD-3047:11)
AD-626 429 FLD. 7/3

•DA-ARO(D)-31-124-G250
RESEARCH TRIANGLE INST DURHAM N C
(AROD-3418:2)
F AD-625 934 FLD. 7/5

•DA-ARO(D)-31-124-G284
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AROD-2636:7)
AD-626 553 FLD. 20/12
PITTSBURGH UNIV PA DEPT OF PHYSICS
(AROD-2636:3)
AD-626 397 FLD. 20/6
(AROD-2636:5)
AD-626 398 FLD. 7/4

•DA-ARO(D)-31-124-G409
DUKE UNIV DURHAM N C
(AROD-3581:13)
F AD-626 053 FLD. 7/3

•DA-ARO(D)-31-124-G428
DUKE UNIV DURHAM N C DEPT OF PHYSICS
(AROD-4121:11)
AD-626 396 FLD. 6/1

•DA-ARO(D)-31-124-G438
TEXAS UNIV AUSTIN DEPT OF PHYSICS
(AROD-4159:2)
AD-626 390 FLD. 20/9

•DA-ARO(D)-31-124-G467
WISCONSIN UNIV MADISON DEPT OF CHEMISTRY
(AROD-4129:4)
AD-626 391 FLD. 20/11

•DA-ARO(D)-31-124-G484
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
(AROD-1271:46)
AD-626 393 FLD. 20/11

•DA-ARO(D)-31-124-G821
SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY
(AROD-4617:2)
AD-626 428 FLD. 7/4

•DA-ARO(D)-31-124-G897
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
(AROD-4582:1)
AD-626 542 FLD. 20/3

•DA-ARO(D)-31-124-G616
CHICAGO UNIV ILL DEPT OF CHEMISTRY
(AROD-5107:3)
AD-626 394 FLD. 7/4

•DA-ARO(D)-31-124-G633
BRIGHAM YOUNG UNIV PROVO UTAH
(AROD-2723:7)
AD-626 427 FLD. 11/6

•DA-ARO(D)-31-124-G642
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
(AROD-3580:20)
AD-626 549 FLD. 7/3

•DA-ARO(D)-31-124-G670
NORTH CAROLINA UNIV CHAPEL HILL
(AROD-4967:6)
AD-626 399 FLD. 12/1
(AROD-4967:5)
AD-626 401 FLD. 12/1
(AROD-4967:4)
AD-626 402 FLD. 6/5

•DA-ARO(D)-31-124-G685
CONNECTICUT UNIV STORRS DEPT OF PHYSICS
(AROD-2805:13)
AD-626 426 FLD. 20/8

•DA-CRD-AG-S92-544-64-G19
INSTITUTE OF MICROBIAL CHEMISTRY TOKYO (JAPAN)
(ARDG(FE)-J-183)
AD-625 951 FLD. 6/15

•DA-CRD-AG-S92-544-64-G20
TOKYO NATIONAL CHEST HOSPITAL (JAPAN)
(ARDG(FE)-J-197)
AD-625 941 FLD. 6/15

•DA-CRD-AG-S92-544-64-G21
KEIO UNIV TOKYO (JAPAN) SCHOOL OF MEDICINE
(ARDG(FE)-J-185)
AD-625 943 FLD. 6/5

•DA-CRD-AG-S92-544-64-G23
KEIO UNIV TOKYO (JAPAN) SCHOOL OF MEDICINE
(ARDG(FE)-J-209)
AD-625 955 FLD. 6/1

•DA-CRD-AG-S92-544-64-G24
YOKOHAMA MUNICIPAL UNIV (JAPAN) FACULTY OF MEDICINE
(ARDG(FE)-J-223)
AD-625 949 FLD. 6/18

•DA-CRD-AG-S92-544-64-G27
SASAKI FOUNDATION MEDICAL INSTITUTION TOKYO (JAPAN)
AD-625 953 FLD. 6/5

•DA-MD-49-193-63-G96
BANGKOK SCHOOL OF TROPICAL MEDICINE (THAILAND)
AD-626 425 FLD. 6/3

•GRANT GP-2111
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 365 FLD. 7/4

•GRANT NSF-GP-2495
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 364 FLD. 9/7

•N123(60530)24981A
ARIZONA UNIV TUCSON ENGINEERING RESEARCH LABS
F AD-625 800 FLD. 11/3

•N123(60530)31686A
CALIFORNIA INST OF TECH PASADENA HYDRODYNAMICS LAB
E-118.27
AD-626 023 FLD. 20/4

•N123(60530)51201A
BATTELLE MEMORIAL INST COLUMBUS OHIO
(NAVWEPS-8746)
AD-626 430 FLD. 20/4

•N600(19)59898
BARRY CONTROLS INC WATERTOWN MASS
BARRY-101
(NADC-AE-6522)
AD-625 816 FLD. 1/3

•N61339-1450
DUNLAP AND ASSOCIATES INC WASHINGTON D C
F AD-625 828 FLD. 9/9

•N62306-1358
DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN
DRL-A-252
AD-625 827 FLD. 12/1

•N62558-4281
UNIVERSITY COLL LONDON (ENGLAND)
AD-626 221 FLD. 3/2

•N62558-4483
BUREAU D'ANALYSE ET DE RECHERCHE APPLIQUEES BOULOGNE-BILLANCOURT (FRANCE)
F AD-626 479 FLD. 13/10

•NASA-NGR-05-002-028
CALIFORNIA INST OF TECH PASADENA
AD-626 452 FLD. 3/2
AD-626 453 FLD. 3/2

•NASA ORDER-R-99
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
AD-625 865 FLD. 6/15

•NBY-32274
BRAUN (C F) AND CO ALHAMBRA CALIF
F AD-626 185 FLD. 13/10

•NGR-05-002-028
CALIFORNIA INST OF TECH PASADENA
AD-626 461 FLD. 3/2

•NIH-NB-01869-09
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 260 FLD. 20/13

•NOBS-88365
DAVIDSON LAB STEVENS INST OF TECH HOBOKEN N J
R-1115
F AD-626 475 FLD. 20/4

•NOBS-92081
GENERAL PRECISION INC LITTLE FALLS N J AEROSPACE RESEARCH CENTER
F AD-625 680 FLD. 11/9

•NOBS-92959
AIR PREHEATER CO INC WELLSVILLE N Y
AD-626 478 FLD. 13/1

•NOBSR-87542

WESTON INSTRUMENTS INC NEWARK N J
AD-626 482 FLD. 9/1

•NOBSR-89229
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
RRL-282 TR-12
AD-625 826 FLD. 17/7
RRL-296
AD-626 324 FLD. 9/5

•NOBSR-89290
CTS KNIGHTS INC SANDWICH ILL
AD-625 669 FLD. 9/1

•NOBSR-89483
GOODRICH (B F) AEROSPACE AND DEFENSE PRODUCTS AKRON OHIO
TR-19
AD-625 670 FLD. 14/2

•NOBSR-89489
HP ASSOCIATES PALO ALTO CALIF
AD-625 676 FLD. 9/1

•NOBSR-91151
GENERAL ELECTRIC CO AUBURN N Y SEMICONDUCTOR PRODUCTS DEPT
F AD-625 769 FLD. 9/1

•NOBSR-91203
MICROWAVE ASSOCIATES INC BURLINGTON MASS
AD-625 765 FLD. 17/9

•NONR-220(47)
CALIFORNIA INST OF TECH PASADENA
AD-626 454 FLD. 20/10
AD-626 455 FLD. 20/8
AD-626 456 FLD. 20/8
AD-626 457 FLD. 20/8
AD-626 458 FLD. 20/8

•NONR-220(47) GRANT
CALIFORNIA INST OF TECH PASADENA
AD-626 452 FLD. 3/2
AD-626 453 FLD. 3/2
AD-626 459 FLD. 3/2
AD-626 461 FLD. 3/2
MONTANA STATE COLL BOZEMAN
AD-626 564 FLD. 3/2

•NONR-220(58)
CALIFORNIA INST OF TECH PASADENA
DIV OF ENGINEERING AND APPLIED SCIENCE
AD-626 460 FLD. 20/11

•NONR-222(43)
CALIFORNIA UNIV BERKELEY
(ONR-66)
AD-626 560 FLD. 12/1

•NONR-222(51)
CLINICAL INVESTIGATION CENTER OAKLAND CALIF
CIC-TR-16
F AD-625 995 FLD. 6/15
CIC-TR-17
AD-625 996 FLD. 6/5
CIC-TR-19
F AD-625 997 FLD. 5/10
CIC-TR-18
AD-625 999 FLD. 6/5
CIC-TR-20
(NAVMED-MR005.12-1700.4)
AD-626 307 FLD. 6/1
CIC-TR-21
(NAVMED-MR005.12-1408.5)
AD-626 308 FLD. 6/15
CIC-TR-22
(NAVMED-MR005-12-1200-7)
F AD-626 310 FLD. 6/1

•NONR-225(00) GRANT
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES
AD-626 496 FLD. 6/20

•NONR-225(30)
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
SUDAER-248
AD-625 716 FLD. 20/11

•NONR-225(30) GRANT
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
SUDAER-248 TR-15
AD-625 715 FLD. 7/4

•NONR-225(37)
COMPUTER SCIENCE DIV STANFORD UNIV CALIF
CS-31
AD-626 315 FLD. 12/1

•NONR-225(47)
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
SUDAER-248
AD-625 716 FLD. 20/11

•NONR-225(51)
BIOPHYSICS LAB STANFORD UNIV CALIF
AD-625 998 FLD. 14/2

•NONR-225(67)
HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF
HEPL-402
AD-626 217 FLD. 20/8

•NONR-233(54)
CALIFORNIA UNIV LOS ANGELES DEPT OF PSYCHOLOGY
AD-626 590 FLD. 5/10

•NONR-233(95)
CALIFORNIA UNIV LOS ANGELES DEPT OF ZOOLOGY
F AD-625 726 FLD. 6/3

•NONR-248(55)
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
4
AD-626 305 FLD. 5/10
6
AD-626 306 FLD. 5/10
7
AD-626 309 FLD. 5/10
AD-626 313 FLD. 5/10

•NONR-248(60) GRANT
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MICROBIOLOGY
AD-626 004 FLD. 6/1

•NONR-248(62) GRANT
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF HYGIENE AND PUBLIC HEALTH
AD-626 569 FLD. 6/5

•NONR-266(61)
HENRY KRUMB SCHOOL OF MINES COLUMBIA UNIV NEW YORK
TR-7
AD-625 912 FLD. 11/6

•NONR-266(89) GRANT
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
AD-626 552 FLD. 6/3

•NONR-401(54)
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
TR-1
AD-625 687 FLD. 20/12

•NONR-404(08)
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF PHYSICS
F AD-626 000 FLD. 7/4

•NONR-404(18)
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J STATISTICS CENTER
TR-N-22
AD-625 886 FLD. 13/8

•NONR-449(00)
STATE UNIV OF NEW YORK BUFFALO DIV OF INTERDISCIPLINARY STUDIES AND RESEARCH
REPT. NO.
S AD-625 685 FLD. 20/11

•NONR-449(00) GRANT
STATE UNIV OF NEW YORK BUFFALO DIV OF INTERDISCIPLINARY STUDIES AND RESEARCH
7
S AD-625 686 FLD. 20/11

•NONR-475(07)
TULANE UNIV NEW ORLEANS LA SCHOOL OF MEDICINE
AD-626 003 FLD. 6/5

•NONR-477(24)
WASHINGTON UNIV SEATTLE DEPT OF ATMOSPHERIC SCIENCES
SCIENTIFIC-6
AD-626 630 FLD. 4/2

•NONR-551(18)
PENNSYLVANIA UNIV PHILADELPHIA
AD-625 869 FLD. 6/4

•NONR-551(40)
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
66-19
AD-626 155 FLD. 9/2

•NONR-558(00)
FLORIDA STATE UNIV TALLAHASSEE
AD-625 909 FLD. 6/16

•NONR-562(10) GRANT
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
AD-626 127 FLD. 20/11

•NONR-562(40)
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
TR-2
AD-626 293 FLD. 20/11
TR-3
AD-626 294 FLD. 20/11

•NONR-595(17) GRANT
MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
BN-421
AD-625 666 FLD. 6/16

•NONR-595(21)
MARYLAND UNIV COLLEGE PARK DEPT OF PSYCHOLOGY
TR-8
AD-626 570 FLD. 5/10

•NONR-609(47)
MASON LAB YALE UNIV NEW HAVEN CONN
6
AD-626 627 FLD. 20/4

•NONR-669(18)
SYRACUSE UNIV N Y DEPT OF PHYSICS
TR-2
AD-626 031 FLD. 20/5

•NONR-760(15)
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF PHYSICS
TR-21
AD-625 761 FLD. 20/8

•NONR-839(36)
POLYTECHNIC INST OF BROOKLYN N Y
F AD-626 314 FLD. 20/5

•NONR-982(07)
OKLAHOMA UNIV RESEARCH INST NORMAN
TR-15
AD-626 490 FLD. 9/5

•NONR-1100(21) GRANT
JET PROPULSION CENTER PURDUE UNIV LAFAYETTE IND
(AFOSR-65-2495)
AD-626 494 FLD. 21/8

•NONR-1100(22)
PURDUE UNIV LAFAYETTE IND SCHOOL OF AERONAUTICS ASTRONAUTICS AND ENGINEERING SCIENCES
TR-32
AD-626 187 FLD. 20/11
TR-31
AD-626 201 FLD. 20/4

•NONR-1138(01)
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
AD-626 462 FLD. 13/2
AD-626 545 FLD. 8/1
AD-626 567 FLD. 8/6

•NONR-1238(00)
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-626 575 FLD. 8/10

•NONR-1286(02) GRANT
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
AD-626 558 FLD. 7/2

•NONR-1589(15)
LITTON SYSTEMS INC MINNEAPOLIS MINN APPLIED SCIENCE DIV
LSI-2926
A AD-625 776 FLD. 13/8

•NONR-1814(32)
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
AD-626 028 FLD. 6/5

•NONR-1834(02)
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
RRL-282 TR-12
AD-625 826 FLD. 17/7

•NONR-1839(03)
ILLINOIS UNIV URBANA
SRS-299
AD-626 214 FLD. 20/11

•NONR-1839(37)
ILLINOIS UNIV URBANA COLL OF VETERINARY MEDICINE
AD-626 022 FLD. 6/5

•NONR-1841(32)
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
AD-626 027 FLD. 6/5
AD-626 030 FLD. 6/5

•NONR-1841(32) GRANT
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
AD-626 029 FLD. 6/5

•NONR-1841(42)
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 021 FLD. 20/4

•NONR-1858(30)
PALMER PHYSICAL LAB PRINCETON UNIV N J
AD-626 020 FLD. 8/4

•NONR-1866(48)
HARVARD COLL OBSERVATORY CAMBRIDGE MASS
SCIENTIFIC-6
AD-626 163 FLD. 7/4
SCIENTIFIC-5
AD-626 164 FLD. 7/4
SCIENTIFIC-7
AD-626 165 FLD. 3/2

•NONR-2121(13)
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
TR-16
AD-626 019 FLD. 20/12

•NONR-2121(17)
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SP-2071/000/00
AD-625 759 FLD. 6/16

•NONR-2196(00)
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
REF-65-63
AD-626 010 FLD. 8/10
REF-65-64
AD-626 011 FLD. 8/7
WHOI-REF-65-65
AD-626 620 FLD. 8/3

•NONR-2216(23)
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-626 547 FLD. 7/2

•NONR-2216(23) GRANT
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-626 548 FLD. 8/10

•NONR-2249(08)
CATHOLIC UNIV OF AMERICA WASHINGTON D C
1-65
AD-625 793 FLD. 20/1

•NONR-2562(00)
WAYNE STATE UNIV DETROIT MICH
AD-625 954 FLD. 5/7

•NONR-2587(01)
MICHIGAN STATE UNIV EAST LANSING DEPT OF PHYSICS
TR-15
AD-626 017 FLD. 20/1

•NONR-2693(00)
MELLON INST PITTSBURGH PA
TR-14
AD-626 154 FLD. 11/9

•NONR-2728(00)
STANFORD RESEARCH INST MENLO PARK CALIF
AD-626 633 FLD. 20/7

•NONR-2733(00)(FBM)
J G ENGINEERING RESEARCH ASSOCIATES BALTIMORE MD
TR-13
AD-626 438 FLD. 20/1

•NONR-2771(05)
OREGON UNIV EUGENE DEPT OF PHYSICS
TR-6
AD-626 227 FLD. 20/13

•NONR-2975(00)
ROSWELL PARK MEMORIAL INST BUFFALO N Y BIOPHYSICS DEPT
AD-626 116 FLD. 7/5

•NONR-3320(00)
LITTON SYSTEMS INC WALTHAM MASS INFORMATION SCIENCES LAB
AD-626 963 FLD. 9/4

•NONR-3348(00)
LOCKHEED-CALIFORNIA CO BURBANK
AD-626 025 FLD. 8/10

•NONR-3353(00)
AVCO MARINE ELECTRONICS OFFICE NEW LONDON CONN
MED-65-1001
AD-626 091 FLD. 20/1

•NONR-3395(00)
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
TR-28
AD-625 725 FLD. 7/3
TR-29
AD-625 749 FLD. 7/4
TR-30
AD-626 001 FLD. 7/3

•NONR-3545(00)
NATIONAL JEWISH HOSPITAL DENVER COLO
AD-626 015 FLD. 6/3

•NONR-3545(00) GRANT
NATIONAL JEWISH HOSPITAL DENVER COLO
AD-626 016 FLD. 6/3

•NONR-3560(00)
AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF
U-3200
AD-626 316 FLD. 7/4

•NONR-3623(00)
VIRGINIA UNIV CHARLOTTESVILLE DEPT OF AEROSPACE ENGINEERING
TR-SRI-22-P
AD-626 061 FLD. 7/4

•NONR-3639(00)
MARTIN CO MIDDLE RIVER MD NUCLEAR DIV
MND-3247
S AD-626 593 FLD. 10/2

•NONR-3656(03)
CALIFORNIA UNIV BERKELEY DEPT OF GEOGRAPHY
AD-626 216 FLD. 5/3

•NONR-3656(12) GRANT
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
AD-626 493 FLD. 6/5
AD-626 543 FLD. 6/5
AD-626 544 FLD. 6/5
AD-626 559 FLD. 6/1
AD-626 561 FLD. 6/5
AD-626 562 FLD. 6/1

•NONR-3706(00)
MARTIN CO ORLANDO FLA
OR-6891
F AD-625 834 FLD. 20/2

•NONR-3729(00)
MECHANICAL TECHNOLOGY INC LATHAM N Y
MTI-65TR60
AD-626 007 FLD. 20/11
MTI-65TR61
AD-626 008 FLD. 20/11

•NONR-3734(00)
TEXAS UNIV AUSTIN DEPT OF PHYSICS
AD-626 014 FLD. 7/4

•NONR-3815(00) (X)
AMPEX CORP REDWOOD CITY CALIF
AMPEX-RR-65-12
AD-625 762 FLD. 13/9

•NONR-3985(02)
ILLINOIS UNIV URBANA DEPT OF PHYSIOLOGY AND BIOPHYSICS
AD-626 037 FLD. 6/3

•NONR-3993(00)
GENERAL DYNAMICS/ELECTRONICS ROCHESTER N Y
AD-626 024 FLD. 6/3

•NONR-3996(01)
ARCTIC INST OF NORTH AMERICA WASHINGTON D C
AD-626 462 FLD. 13/2
AD-626 545 FLD. 8/1
AD-626 546 FLD. 9/11

AD-626 565 FLD. 6/3

•NONR-4008(02)
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
65-3
A AD-625 877 FLD. 8/10

•NONR-4010(03)
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF PSYCHOLOGY
4
AD-626 305 FLD. 5/10
6
AD-626 306 FLD. 5/10
7
AD-626 309 FLD. 5/10
8
AD-626 311 FLD. 5/8
AD-626 313 FLD. 5/10

•NONR-4010(09)
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF STATISTICS
AD-626 018 FLD. 6/3

•NONR-4012(00)-FBM
RADIO CORP OF AMERICA LANCASTER PA DIRECT ENERGY CONVERSION DEPT
AD-626 449 FLD. 10/2

•NONR-4018(01)GRANT
STATE UNIV OF NEW YORK BROOKLYN DOWNSTATE MEDICAL CENTER
AD-626 026 FLD. 6/16

•NONR-4019(00)
STAUFFER CHEMICAL CO RICHMOND CALIF WESTERN RESEARCH CENTER
S AD-625 723 FLD. 21/9.2

•NONR-4054(00)
TRACOR INC AUSTIN TEX
TRACOR-66-104-U
AD-626 211 FLD. 7/2

•NONR-4073(00)
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
UTIAS-109
AD-626 451 FLD. 20/4

•NONR-4102(01)
MASSACHUSETTS INST OF TECH CAMBRIDGE
MAC-TR-22
AD-625 728 FLD. 9/2
MASSACHUSETTS INST OF TECH CAMBRIDGE ELECTRONIC SYSTEMS LAB
AD-626 554 FLD. 5/8

•NONR-4154(00)
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
RMD-5515
AD-625 667 FLD. 7/4
RMD-5515
AD-625 668 FLD. 7/4

•NONR-4183(00)
INSTITUTE FOR SCIENTIFIC INFORMATION INC PHILADELPHIA PA
AD-626 555 FLD. 5/2

•NONR-4200(00)
AMERICAN CYANAMID CO STAMFORD CONN CENTRAL RESEARCH DIV
06-1432-25-Q10
AD-626 295 FLD. 7/5

•NONR-4222(01)
CALIFORNIA UNIV SANTA BARBARA
TR-14
AD-626 556 FLD. 7/4
TR-15
AD-626 557 FLD. 7/4
CALIFORNIA UNIV SANTA BARBARA DEPT OF PHYSICS
TR-12
AD-626 649 FLD. 20/12

•NONR-4278(00)
VIDYA DIV ITEK CORP PALO ALTO CALIF
VIDYA-209
AD-626 035 FLD. 13/10

•NONR-4306(00)
WESTERN CO OF NORTH AMERICA DALLAS TEX RESEARCH DIV
F AD-625 801 FLD. 20/4

•NONR-4364(00) GRANT
STATE UNIV OF NEW YORK BUFFALO
AD-626 573 FLD. 6/1

•NONR-4482(00)
TRG INC MELVILLE N Y
TRG-036-FR
F AD-626 158 FLD. 20/4

•NONR-4745(00)
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SP-2169/000/01
AD-626 173 FLD. 5/8

•NONR-4878(00)
HUGHES AIRCRAFT CO CULVER CITY CALIF AEROSPACE GROUP
AD-625 894 FLD. 20/5

•NONR-4881(00)
AVCO EVERETT RESEARCH LAB EVERETT MASS
RR-237
AD-626 006 FLD. 6/16

•NONR-4974(00)
BUNKER-RAMO CORP CANOGA PARK CALIF SYSTEMS EFFECTIVENESS DEPT
AD-626 638 FLD. 5/5

•NONR-5013(00)
SPACE/DEFENSE CORP BIRMINGHAM MICH
AD-625 873 FLD. 4/2

•NONR(G)-00042-63
ADELPHI UNIV GARDEN CITY N Y DEPT OF GRADUATE MATHEMATICS
AGM-127
F AD-626 222 FLD. 12/1

•NONR(G)-00096-62
INSTITUTE OF MARINE RESOURCES UNIV OF CALIFORNIA LA JOLLA
AD-625 986 FLD. 8/1

•NORD-7386
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
APL/JHU-TG-245-6
AD-626 417 FLD. 9/1
TG-291
AD-626 448 FLD. 17/9
TG-240
AD-626 449 FLD. 9/1
TG-288-1
AD-626 450 FLD. 9/5
TG-293
AD-626 464 FLD. 21/2
TG-247
AD-626 574 FLD. 16/2
TG-309
AD-626 576 FLD. 21/2
TG-313-2
AD-626 577 FLD. 4/2
TG-313-1
AD-626 578 FLD. 4/2
TG-301
AD-626 579 FLD. 4/2
TG-303
AD-626 619 FLD. 5/10
TG-326
(TT-66-60263)
AD-626 615 FLD. 20/3
TG-327
AD-626 616 FLD. 9/1

•NOW-62-0604-C
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
TG-718
AD-626 301 FLD. 20/4
TG-230-T460
(TT-66-60262)
AD-626 568 FLD. 20/4

•NOW-64-0394-D
WESTINGHOUSE ASTRONUCLEAR LAB PITTSBURGH PA
WANL-PR-M-014-PT-3
S AD-626 622 FLD. 11/6

•NOW-64-0397-F
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF MATERIALS SCIENCES LAB
AD-626 497 FLD. 7/4

•NOW-65-0106-D
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
F AD-626 376 FLD. 13/8

•NOW-65-0470-D
SPACE-GENERAL CORP EL MONTE CALIF ARTIFICIAL BIOSYSTEMS LAB
SGC-864
AD-625 895 FLD. 7/4

•NOW-65-0502-F
ARINC RESEARCH CORP ANNAPOLIS MD
SL-7
AD-626 416 FLD. 16/9.1

•NRC-CG-9
BRITISH COLUMBIA RESEARCH COUNCIL VANCOUVER
AD-626 101 FLD. 8/1

•NSF-G-450
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
AD-626 233 FLD. 4/1
AD-626 234 FLD. 4/1

•NSF-G4220
CATHOLIC UNIV OF AMERICA WASHINGTON D C
AD-626 125 FLD. 12/1

•NSF-G-7423
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
(AROD-3580:20)
AD-626 549 FLD. 7/3

•NSF-G9968
CATHOLIC UNIV OF AMERICA WASHINGTON D C
AD-626 125 FLD. 12/1
AD-626 499 FLD. 12/1

•NSF-G-11098
WASHINGTON UNIV SEATTLE
AD-626 120 FLD. 12/1

•NSF-G-11287
YALE UNIV NEW HAVEN CONN
AD-626 354 FLD. 12/1
AD-626 355 FLD. 12/1

•NSF-G-11321
CORNELL UNIV ITHACA N Y
AD-626 118 FLD. 12/1

•NSF-G-11567
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
AD-626 123 FLD. 20/2
AD-626 127 FLD. 20/11

•NSF-G-11591
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
AD-626 558 FLD. 7/2

•NSF-G16926
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-626 366 FLD. 6/16

•NSF-G-19372

JOHNS HOPKINS UNIV BALTIMORE MD
DEPT OF MICROBIOLOGY
AD-626 004 FLD. 6/1

•NSF-GB-4
ILLINOIS UNIV URBANA DEPT OF MICROBIOLOGY
AD-626 115 FLD. 6/13

•NSF-GB-3131
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
AD-626 552 FLD. 6/3

•NSF-GK-17
STATE UNIV OF NEW YORK BUFFALO DIV OF INTERDISCIPLINARY STUDIES AND RESEARCH
7
S AD-625 686 FLD. 20/11

•NSF-GK-47
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
SUDAER-245 TR-15
AD-625 715 FLD. 7/4

•NSF-GP-96
CATHOLIC UNIV OF AMERICA WASHINGTON D C
(AFOSR-65-1963)
AD-626 386 FLD. 12/1

•NSF-GP-998
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
(AFOSR-65-1835)
AD-625 939 FLD. 20/8

•NSF-GP-1193
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
(AFOSR-65-1816)
AD-626 060 FLD. 20/10

•NSF-GP-1976
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
66-13
(AROD-4166:7)
AD-626 472 FLD. 9/7

•NSF-GP-2495
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-625 673 FLD. 9/5
AD-625 674 FLD. 20/3
AD-626 361 FLD. 20/12
AD-626 362 FLD. 9/1

•NSF-GP-2528
CHARGED PARTICLE RESEARCH LAB UNIV OF ILLINOIS URBANA
(AFOSR-65-2496)
AD-626 521 FLD. 14/2

•NSF-GP-2684
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
ERL-65-25
AD-625 987 FLD. 9/5

•NSF-GP-3601
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-626 548 FLD. 8/10

•NSG-357
CALIFORNIA INST OF TECH PASADENA
AD-626 459 FLD. 3/2

•NSG-430
MONTANA STATE COLL BOZEMAN
AD-626 564 FLD. 3/2

•NSG-438
HARVARD COLL OBSERVATORY CAMBRIDGE MASS
SCIENTIFIC-6
AD-626 163 FLD. 7/4

SCIENTIFIC-5
AD-626 164 FLD. 7/4
SCIENTIFIC-7
AD-626 165 FLD. 3/2

•NSG-460
HARVARD COLL OBSERVATORY CAMBRIDGE MASS METEOR DEPT
F AD-626 223 FLD. 3/1

•OCD-OS-63-172
LIN (T Y) AND ASSOCIATES VAN NUYS CALIF•
F AD-625 866 FLD. 13/12
F AD-625 867 FLD. 19/3

•OCD-OS-64-187
ARIZONA UNIV TUCSON ENGINEERING RESEARCH LABS
F AD-625 782 FLD. 13/13

•OCD-PS-64-55
STANFORD RESEARCH INST MENLO PARK CALIF
F AD-625 802 FLD. 19/3

•OCD-PS-64-117
NEW YORK STATE VETERINARY COLL ITHACA DEPT OF PHYSICAL BIOLOGY
F AD-626 320 FLD. 6/18

•OCD-PS-64-281
IONICS INC WATERTOWN MASS RESEARCH DIV
F AD-626 210 FLD. 6/8

•OEP-SE-65-5
PUBLIC ADMINISTRATION SERVICE CHICAGO ILL
AD-625 985 FLD. 13/12

•PHS-AI-01876
PUERTO RICO UNIV SAN JUAN SCHOOL OF MEDICINE
AD-626 370 FLD. 6/3

•PHS-AI-05840-01
NATIONAL JEWISH HOSPITAL DENVER COLO
AD-626 016 FLD. 6/5

•PHS-AM-06864-03
MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
BN-421
AD-625 666 FLD. 6/16

•PHS-AM-07908
SCRIPPS CLINIC AND RESEARCH FOUNDATION LA JOLLA CALIF
AD-626 387 FLD. 6/3

•PHS-AM-08804-01
STATE UNIV OF NEW YORK BUFFALO
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AD=625 896 FLD. 9/2

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DRML=RP=572
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AD=625 689 FLD. 4/2

ECOM=01319=1=T
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ECOM=01412=1
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ECOM=01449=22
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ECOM=2633
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ECOM=2636
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ERL=65=25
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ESD=TDR=65=227
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ESD=TR=65=82
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ESD=TR=65=116
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ESD=TR=65=117
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ESD=TR=65=121
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ESD=TR=65=123
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ESD=TR=65=478
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626 090	5/2
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626 092	3/2
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626 094	20/2
626 095	20/8
626 096	4/1
626 097	4/1
626 098	4/1
626 099	4/1
626 100	20/10
626 101	8/1
626 102	8/7
626 103	8/7
626 104	20/8
626 105	3/2
626 106	5/4
626 107	22/2
626 108	20/8
626 109	5/10
626 110	7/4
626 111	3/2
626 112	5/10
626 113	8/7
626 114	20/3
626 115	6/13
626 116	7/5
626 117	6/16
626 118	12/1
626 119	6/5
626 120	12/1
626 121	6/18
626 122	6/18
626 123	20/2
626 124	19/4
626 125	12/1
626 126	19/4
626 127	20/11
626 128	5/10
626 129	20/3
626 130	6/3
626 131	20/12
626 132	20/9
626 133	20/12
626 134	20/12
626 135	6/5
626 136	6/5
626 137	7/2
626 138	5/9
626 139	2/2
626 140	10/2
626 141	10/2
626 142	10/2
626 143	9/2
626 144	20/14
626 145	5/2
626 146	17/8
626 147	18/3
626 148	6/3
626 149	7/1
626 150	1/5
626 151	8/8
626 152	16/2
626 153	14/1
626 154	11/9
626 155	9/2
626 156	7/4
626 157	20/14
626 158	20/4
626 159	4/2
626 160	20/4
626 161	14/4
626 162	9/4
626 163	7/4
626 164	7/4
626 165	3/2
626 166	20/14
626 167	4/1
626 168	14/2
626 169	12/1
626 170	19/1
626 171	21/9.2
626 172	19/6
626 173	5/8
626 174	8/13
626 175	8/13
626 176	6/8
626 177	9/5
626 178	6/8
626 179	11/9
626 180	8/11
626 181	9/1
626 182	9/1
626 183	9/5
626 184	7/2
626 185	13/10
626 186	11/6
626 187	20/11
626 188	7/4
626 189	19/1
626 190	13/8
626 191	9/2
626 192	14/5
626 193	6/8
626 194	4/1
626 195	9/1
626 196	20/14
626 197	20/14
626 198	4/1
626 199	4/1
626 200	9/2
626 201	20/4
626 202	7/4
626 203	4/1
626 204	9/2
626 205	4/1
626 206	18/8
626 207	5/7
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626 209	6/5
626 210	6/8
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626 212	20/5
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626 214	20/11
626 215	20/3
626 216	5/3
626 217	20/8
626 218	16/4.1
626 219	9/1
626 220	8/6
626 221	3/2
626 222	12/1
626 223	3/1
626 224	9/5
626 225	11/6
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626 235	12/1
626 236	20/14
626 237	12/1
626 238	8/11
626 239	11/6
626 240	20/14
626 241	9/4
626 242	8/11
626 243	21/2
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626 245	6/16
626 246	8/6
626 247	8/2
626 248	8/6
626 249	8/7
626 250	8/6
626 251	8/6
626 252	13/2
626 253	8/6
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626 258	14/2
626 259	6/16
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626 268	4/1
626 269	9/5
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626 271	8/9
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626 273	21/8.1
626 274	8/2
626 275	8/6
626 276	8/6
626 277	6/13
626 278	22/3
626 279	6/5
626 280	6/5
626 281	8/1
626 282	9/5
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626 286	5/9
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626 290	12/1
626 291	6/18
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626 296	9/1
626 297	20/10
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626 306	5/10
626 307	6/1
626 308	6/15
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626 311	5/8
626 312	7/5
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626 314	20/5
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626 317	8/1
626 318	12/1
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626 321	9/5
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626 330	20/8
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626 417	9/1
626 418	6/16
626 419	9/1
626 420	10/2
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626 432	11/3
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626 482	9/1
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626 570	5/10
626 571	14/2
626 572	5/7
626 573	6/1
626 574	16/2
626 575	8/10
626 576	21/2
626 577	4/2
626 578	4/2
626 579	4/2
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626 581	11/10
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626 583	13/8
626 584	13/8
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626 586	11/6
626 587	14/2

626 588	6/11
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626 602	13/8
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626 634	20/11
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626 638	5/5
626 639	7/4
626 640	7/3
626 641	6/8
626 642	7/4
626 643	17/3
626 644	7/4
626 645	14/2
626 646	6/8
626 647	7/4
626 648	20/12
626 649	20/12

OTHER RESEARCH REPORTS AND RELATED MATERIAL

1. AERONAUTICS

N65-18097 **Field 1A**
CFSTI Prices: HC$1.00 MF$0.50
Jep Propulsion Lab., Calif. Inst. of Tech., Pasadena.
AERODYNAMIC CHARACTERISTICS OF BLUNT BODIES,
by J. O. Nichols and E. A. Nierengarten. 19 Nov 64, 21p JPL-TR-32-677
Contract NAS7-100
NASA CR-57087

Descriptors: (*Blunt bodies, Aerodynamic characteristics).

N65-21355 **Field 1A**
CFSTI Prices: HC$2.00 MF$0.50
Catholic Univ. of America, Washington, D. C. Dept. of Space Science and Applied Physics.
STABILITY OF A SHEAR FLOW IN AN UNSTABLE LAYER,
by Thomas J. Eisler. Jan 65, 27p DSSAP-65-003
Grant NsG-586
NASA CR-57879

Descriptors: (*Turbulent boundary layer, Stability), (*Gas flow, Stability).

PB-168 860 **Field 1C, 1A**
CFSTI Prices: HC$6.00 MF$1.50
Goodyear Aircraft Corp., Akron, Ohio.
DROP TESTS OF 16,000-SQUARE-INCH MODEL PARACHUTES. VOLUME I.
Technical rept.,
by F. J. Stimler and R. S. Ross. Apr 60, 234p GER-5108
Contract AF33 (616)-2310,
Proj. GA335
AF TR-5867;
AD 241 695

Descriptors: (*Parachutes, Drop testing), Experimental design, Aerodynamic configurations, Aerodynamic characteristics.

Performance in free fall of 27 model parachutes of various designs was determined by drop tests conducted in the Goodyear Aircraft Corporation Airship Dock at Akron, O. Tested were models of the following types with 16,000 sq. in. in total canopy area: Solid, Flat, Solid Extended, Skirt, Solid Spherical, Solid Conical, Airfoil, Exeter Type 12, Guide Surface, Ring Slot, and FIST Ribbon. All models were tested at vertical terminal velocities of approximately 10, 15, 25 and 40 feet per second both for vertical and horizontal types of release. Results of the drop tests are inserted in the appendices and include a copy of the original data sheets giving the space coordinates of the parachute throughout the descent along with a descriptive remark on the parachute performance. The appendices also include a plan-view, oscillation, and trajectory curve for each of the drop tests analyzed completely, followed by a representative sketch of the parachute sketch of the parachute canopy in question. (Author)

PB-169 013 **Field 1D**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
AUTOMATIC FLIGHT CONTROL ANALYZER AN/ASM103, PART NO. 421830-01-01, 421830-01-02, 424040-01-01, Y63-315880-631.
Instrument calibration procedure manual.
15 Oct 65, 40p NAVWEPS-17-20QT-03
PB 167 811 superseded

Descriptors: (*Automatic pilots, Test equipment), (*Test equipment, Calibration), Instruction manuals, Test methods.

The manual contains calibration instructions that will enable calibration personnel to determine whether the equipment is operating within the prescribed specification limitations. It also includes a list of calibration equipment, corrective action instructions, instructions for the evaluation and recording of data, and difference data sheets.

PB-169 032 **Field 1B, 17G**
CFSTI Prices: HC$3.00 MF$0.75
Systems Research and Development Service, Federal Aviation Agency, Washington, D. C.
INTERNATIONAL AVIATION RESEARCH AND DEVELOPMENT SYMPOSIUM (3rd), AUTOMATION IN AIR TRAFFIC CONTROL. TECHNICAL PAPERS, SESSION I, SYSTEM DESIGN I.
Held 1-3 Nov 65, Atlantic City, N. J.
1965, 84p

Descriptors: (*Air traffic control systems, Automation), (*Aeronautics, Air traffic control systems), Europe, Radar navigation, Radar tracking, Data processing systems, Global communication systems, Systems engineering, International law, Symposia.

Contents: Digitalization primary and secondary radar and automation methods as they will be applied to the upper A.T.C. center for Belgium, Netherlands and North Germany; ATC simulation and automatic data processing studies-the role of the Eurocontrol experimental systems; Evaluation of computer facilities for oceanic control; The approach to automating ATC in France.

PB-169 033 **Field 1B, 17G**
CFSTI Prices: HC$3.00 MF$0.75
Systems Research and Development Service, Federal Aviation Agency, Washington, D. C.
INTERNATIONAL AVIATION RESEARCH AND DEVELOPMENT SYMPOSIUM (3rd), AUTOMATION IN AIR TRAFFIC CONTROL. TECHNICAL PAPERS, SESSION II, SYSTEM DESIGN II.
Held 1-3 Nov 65, Atlantic City, N. J.
1965, 71p
See also PB-169 032.

Descriptors: (*Air traffic control systems, Automation), (*Aeronautics, Air traffic control systems), Japan, Europe, Navigational aids, Data processing systems, Computers, Display systems, Radar tracking, Systems engineering, International law, Symposia.

Contents: Air traffic control automation in Japan; The planned implementation of computer directed displays in air traffic control; A survey of experiences with the Satco-System; Current plans for air traffic control data processing in the United Kingdom, National Airspace design concepts and system configuration.

PB-169 034 **Field 1B, 17G**
CFSTI Prices: HC$3.00 MF$0.75
Systems Research and Development Service, Federal Aviation Agency, Washington, D. C.
INTERNATIONAL AVIATION RESEARCH AND DEVELOPMENT SYMPOSIUM (3rd). AUTOMATION IN AIR TRAFFIC CONTROL. TECHNICAL PAPERS, SESSION III: SUBSYSTEM CONSIDERATIONS.
Held 1-3 Nov 65, Atlantic City, N. J.
1965, 84p
See also PB-169 033. Distribution: No limitation.

Descriptors: (*Air traffic control systems, Automation), (*Aeronautics, Air traffic control systems), Data processing systems, Radar tracking, Computers, Display systems, Systems engineering, International law, Symposia.

Contents: The application of automation to the solution of air traffic control problems; Prospects and experimentation of radar data handling at the Orly, France regional control center; the remaining problems of surveillance radar auto tracking; Primary and secondary radar data processing under varying clutter conditions.

PB-169 050 **Field 1D**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
GYROSCOPE TEST SET AN/ASM-117 PART NO. Y63-315880-483, PART NO. Y63-315880-941.
Instrument calibration procedure manual.
15 Oct 65, 16p NAVWEPS-17-20QT-01
PB 167 810 superseded
Rept. dated 1 Feb 65 superseded.

Descriptors: (*Gyroscopes, Test sets), (*Test sets, Calibration), Test equipment, Automatic pilots, Target drones, Instruction manuals, Test methods.

Identifiers: AN/ASM-117.

The manual contains calibration instructions that will enable calibration instructions that will enable calibration personnel to determine whether the equipment is operating within the prescribed specification limitations. It also includes a list of calibration equipment, corrective action instructions, and instructions for the evaluation and recording of data. The Test Instrument generates signals and supplies the voltages that check and verify the operational status of the directional displacement gyroscope and gyroscope control.

PB-169 051 **Field 1D, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
ALTITUDE CONTROLLER TESTER PART NO. VPT-10G-11414A, VPT-10G-11414B, VPT-10G-12510, VPT-10G-12510A.
Instrument calibration procedure manual.
15 Oct 65, 21p NAVWEPS-17-20QT-07
Supersedes rept. no. NAVWEPS-17-20QT-07 dated 1 Feb 65.

Descriptors: (*Automatic pilots, Test equipment), (*Test equipment, Calibration), Altitude, Control systems, Instruction manuals, Test methods.

The manual contains calibration instructions for Altitude Controller Tester, PN VPT-10G-11414A and VPT10G-11414B. A list of calibration equipment required, and instructions for corrective action and for evaluating and recording data are included. The Altitude Controller Tester is a portable, self-contained, regulated static pressure source functioning as a leak tester of the altitude controller static system. The Test Instrument consists of a motor pump assembly, an oil reservoir, a static control valve, two differential relief valves, a needle valve, altimeter, and an electrical power system.

2. AGRICULTURE

PB-168 883 **Field 2A, 20D**
CFSTI Prices: HC$3.00 MF$0.75
Illinois Univ., Urbana. Dept. of Computer Science.
NUMERICAL SOLUTION OF PLANE VISCOUS SHOCK REFLECTIONS.
Doctoral thesis,
by Tzu-Sien Shao. 30 Sep 65, 76p Rept. no. 190
Contract AT (11-1)-1469, Grant NSF-GP-4636

Descriptors: (*Numerical analysis, Fluid flow), (*Fluid flow, Numerical analysis), Two-dimensional flow, Shock waves, Viscosity, Dynamics, Partial differential equations.

Identifiers: Theses.

A numerical method is presented for the solution of two-dimensional, viscous fluid flow problems. Emphasis is placed on the formulation and solution of weak shock reflections. The basic equations

used are the timedependent Navier-Stokes equations without heat conduction. A version of the shock reflection theory dividing flow into various regions is discussed. A behavior similar to experimental results is displayed by the numerical results of this theory, although they do not quite agree with the experimental data. To show that the NavierStokes description of the fluid flow is an adequate model for the weak shock reflection problems, equations of motion are numerically integrated by a difference scheme to obtain asymptotically stationary solution. A transformation of independent variables is first made to reduce computation time. Stability analysis is performed to give an upper bound for the time step. Numerical results are given for asymptotically stationary weak shock reflections. Reflected shock angles for both regular and Mach reflections obtained agree well with those given by shock tube experiments. (Author)

3. ASTRONOMY AND ASTROPHYSICS

N65-16264 **Field 3B**
CFSTI Prices: HC$2.00 MF$0.50
Geological Survey, Washington, D. C.
ASTROGEOLOGIC STUDIES- SUMMARY.
Annual progress rept., 1 Jul 63-1 Jul 64.
Nov 64, 35p
NASA Order R-66
NASA CR-60509

Descriptors: (*Astronomy, Geology), Geophysics, Astrophysics.

N65-16265 **Field 3B**
CFSTI Prices: HC$4.00 MF$1.00
Geological Survey, Washington, D. C.
ASTROGEOLOGIC STUDIES. PART A- LUNAR AND PLANETARY INVESTIGATIONS.
Annual progress rept., 1 Jul 63-1 Jul 64.
Nov 64, 144p
NASA Order R-66
NASA CR-60510

Descriptors: (*Moon, Mapping).

Identifiers: Selenodetics.

N65-16266 **Field 3A**
CFSTI Prices: HC$5.00 MF$1.25
Geological Survey, Washington, D. C.
ASTROGEOLOGIC STUDIES. PART B- CRATER INVESTIGATIONS.
Annual progress rept., 1 Jul 63-1 Jul 64.
Nov 64, 194p
NASA CR-60515

Descriptors: (*Meteors, Geology), (*Moon, Topography).

N65-16267 **Field 3B**
CFSTI Prices: HC$4.00 MF$1.00
Geological Survey, Washington, D. C.
ASTROGEOLOGIC STUDIES. PART C- COSMIC CHEMISTRY AND PETROLOGY.
Annual progress rept. no. 5, 1 Jul 63-1 Jul 64.
Nov 64, 123p
NASA Order R-66
NASA CR-60516

Descriptors: (*Meteorites, Chemistry), (*Petrology, Meteorites).

N65-16740 **Field 3A**
CFSTI Prices: HC$5.00 MF$1.00
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
EXPERIMENTAL DESIGN STUDY, MICROSCOPIC SYSTEM FOR MARS STUDY PROGRAM, 2 OCTOBER 1962 - 2 JUNE 1963,
by L. R. Flink, V. W. Greene, D. A. Lundgren, D. D. Mullin, and J. H. Nash. 14 Jun 63, 165p
Rept. no. 2405
Contracts NAS7-100, JPL-950123
NASA CR-60650

Descriptors: (*Mars, Scientific research).

N65-18275 **Field 3B**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
DO SOLAR PROTON EVENTS MEASURE GEOMETRY OF A DIFFUSION PROCESS QUES,
by E. Boldt. Dec 64, 11p NASA-TM-X-55161, X-311-64-371

Descriptors: (*Solar flares, Protons).

N65-33835 **Field 3B**
CFSTI Prices: HC$5.00 MF$1.25
IIT Research Inst. Chicago, Ill.
A REVIEW OF RECENT DETERMINATION OF THE COMPOSITION AND SURFACE PRESSURE OF THE ATMOSPHERE OF MARS,
by M. W. P. Cann, W. D. Davies, J. A. Greenspan, and T. C. Owen. Sep 65, 186p
Contract NAS5-903
NASA CR-298

Descriptors: (*Mars, Planetary atmospheres), (*Planetary atmospheres, Mars).

NYO-8924 **Field 3B, 18H**
CFSTI Prices: HC$4.00 MF$1.00
Carnegie Inst. of Tech., Pittsburgh, Pa. Dept. of Chemistry.
COSMOGENIC RADIONUCLIDES IN STONE METEORITES.
Doctoral thesis,
by Philip J. Cressy, Jr. 1 Jun 64, 135p
Contract AT (30-1)-844
Submitted to Carnagie Inst. of Tech., Pittsburgh, Pa.

Descriptors: (*Meteorites, Cosmic rays), (*Cosmic rays, Radioactive isotopes).

PB-168 603 **Field 3B**
CFSTI Prices: HC$2.00 MF$0.50
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
SOLAR RADIO FLUX DURING THE IQSY AT UNIVERSITY PARK, PENNA., APRIL-MAY-JUNE, 1965.
Ionospheric research scientific rept.,
by John P. Hagen. 20 Dec 65, 31p Scientific-258D
Grant NSF-GP-2986

Descriptors: (*Radio astronomy, Solar radiation), (*Solar radiation, Radio waves), (*Sun, Radio astronomy), Ultrahigh frequency, Superhigh frequency, Extraterrestrial radio waves, Astronomical observatories, Pennsylvania.

Identifiers: IQSY.

This report contains solar radio flux data recorded at 10,700 mc/s and 2,700 mc/s. A table of distinct events is also given. (Author)

PB-168 607 **Field 3B, 17I**
CFSTI Prices: HC$1.00 MF$0.50
Weather Bureau, Washington, D. C. Meteorological Engineering.
A METEOROLOGICAL RADAR TRANSPONDER.
Technical note,
by William A. Kuning. Sep 65, 20p WBTN-7-METENG-15

Descriptors: (*Meteorological radar, Transponders), (*Transponders, Meteorological radar), (*Weather stations, Meteorological radar), Weather forecasting, Meteorological parameters, Data storage systems, Data transmission systems, Remote control systems, Weather communications, Meteorological instruments.

This is a brief history and description of a Meteorological Radar Transponder (MRT) designed to store rain or snowfall and, upon interrogation by a Weather Bureau surveillance radar, to transmit its stored and encoded data to the interrogating radar. (Author)

PB-168 609 **Field 3B, 9B, 1B**
CFSTI Prices: HC$2.00 MF$0.50
Weather Bureau, Washington, D. C. Meteorological Engineering.
AUTOMATIC METEOROLOGICAL OBSERVING SYSTEM (AMOS).
Technical note,
by Claude A. Kettering. Sep 65, 38p WBTN-12-METENG-16

Descriptors: (*Weather stations, Automation), (*Data processing systems, Weather stations), (*All-weather aviation, Weather stations), Weather forecasting, Weather communications, Display systems, Automatic, Meteorological instruments, Digital computers.

Identifiers: AMOS.

The AMOS V (Automatic Meteorological Observing System) is a unique system that uses a magnetic drum to log data from sensors and a digital processor to process the data. The system includes decision making circuits for transmitting and displaying information. A short summary of the development of Automatic Weather Stations by the U. S. Weather Bureau is included in the appendix.

PB-168 610 **Field 3B**
CFSTI Prices: HC$3.00 MF$0.75
Weather Bureau, Washington, D. C.
LOCAL CLOUD AND PRECIPITATION FORECAST METHOD (SLYH).
Notes to forcasters,
by Matthew H. Kulawiec. Sep 65, 63p WBTN-13-FCST-2

Descriptors: (*Weather forecasting, Mathematical prediction), Clouds, Atmospheric precipitation, Air mass analysis, Meteorological charts.

Identifiers: SLYH method.

This note presents a short discussion of a manual technique for local short range forecasting based on the concepts used in the SLYH Quantitative Precipitation Forecasting Model. SLYH stands for the names of the developers of the model: Sanders, La Rue and Younkin (1). Hovermale wrote the program which enables the forecast to be computed by machine. Calculations are based on simple models of air motion and moisture content neglecting the role of aerosols and behavior of cloud particles.

PB-168 901 **Field 3A**
CFSTI Prices: HC$2.00 MF$0.50
Lowell Observatory, Flagstaff, Ariz.
PROPER MOTION SURVEY OF THE NORTHERN HEMISPHERE WITH THE 13-INCH PHOTOGRAPHIC TELESCOPE OF THE LOWELL OBSERVATORY.
Bulletin vol. 4, no. 1; Lowell Proper Motions 1,
by H. L. Giclas. Jul 58, 42p Bull-89
Grant NSF G2374

Descriptors: (*Celestial mechanics, Stars), (*Stars, Celestial mechanics), Astronomy, Northern Hemisphere, Optical tracking, Telescopes.

PB-168 963 **Field 3B**
CFSTI Prices: HC$7.85 MF$2.25
Michigan Univ., Ann Arbor. Radio Astronomy Observatory.
SOLAR RADIO ASTRONOMY, VOLUME II,
by Mukul R. Kundu. Mar 64, 485p Rept. no. 64-4
Grants NSF-G19133, NSF-GP-1670
N64 22235

Descriptors: (*Radio astronomy, Sun), (*Sun, Radio astronomy), (*Solar radiation, Radio waves), Extraterrestrial radio waves, Solar flares, Sunspots, Solar wind, Cosmic rays.

4. ATMOSPHERIC SCIENCES

N65-18192 **Field 4A**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
DETAILED BEHAVIOR OF THE MIDLATITUDE IONOSPHERE FROM THE EXPLORER XVII SATELLITE,
by A. Dalgarno, L. H. Brace, and N. W. Spencer. Nov 64, 38p NASA-TM-X-55151, X-651-64-358

Descriptors: (*Ionosphere, Scientific research).

N65-18258 **Field 4A**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
THE EFFECT OF A VARIABLE ELECTRON TEMPERATURE ON THE EQUATORIAL ELECTRON DENSITY DISTRIBUTION IN THE UPPER IONOSPHERE,
by R. A. Goldberg. Oct 64, 34p NASA-TM-X-55135, X-615-64-279

Descriptors: (*Ionosphere, Electron density), (*Electron density, Distribution).

N65-18268 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.75
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
SOME ASPECTS OF WIND SHEAR IN THE UPPER ATMOSPHERE,
by R. G. Roper. Nov 64, 63p NASA-TM-X-55151, X-651-64-337

Descriptors: (*Upper atmosphere, Shear stresses), (*Wind, Shear stresses).

N65-18276 **Field 4A**
CFSTI Prices: HC$3.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
PROPAGATION OF THE PRESSURE WAVES PRODUCED BY AURORAS,
by K. Maeda. Dec 64, 58p NASA-TM-X-55163, X-640-64-383
Presented at the 2d Benedum Earth Symp., Pittsburgh, 23-25 Nov. 1964.

Descriptors: (*Aurorae, Mechanical waves), (*Mechanical waves, Propagation).

N65-21332 **Field 4A**
CFSTI Prices: HC$1.00 MF$0.50
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
ADIABATIC MOTIONS OF CHARGED PARTICLES IN A DIPOLE MODEL OF THE MAGNETOSPHERE,
by Edward W. Hones, Jr. Mar 65, 23p IU-65-6
Grant NsG-233-62
NASA CR-57944

Descriptors: (*Upper atmosphere, Charged particles), (*Charged particles, Upper atmopshere).

PB-168 897 **Field 4B**
CFSTI Prices: HC$2.00 MF$0.50
Chicago Univ., Ill. Cloud Physics Lab.
WINTER 1965 FIELD TESTS OF UREA, ION INCORPORATED SILICA AND HYDROPHOBED SILICA AS SEEDING REAGENTS,
by John B. Kidney. 1 Oct 65, 37p Technical note TN-31
Grant NSF-G22419

Descriptors: (*Artificial precipitation, Chemicals), Ice, Nucleation, Urea, Silicon compounds, Clouds, Chemical precipitation, Meteorology.

During the winter of 1965, a series of airborne cloud seeding experiments was undertaken to field test the effectiveness of three new seeding agents: Hydrophobed silica, ion incorporated silica and milled urea. These materials were used in cold winter stratus clouds with varying degrees of success as described herein. All of the materials tested produced showers that could definitely be ascribed to seeding, with urea producing a shower on one occasion equal to or better than the dry ice shower. The results of the experiments indicate that a certain minimum crystal concentration is necessary to trigger a cloud into precipitation. (Author)

PB-168 898 **Field 4A, 20N**
CFSTI Prices: HC$2.00 MF$0.50
Alaska Univ., College. Geophysical Inst.
THE DETERMINATION OF THE DIURNAL VARIATION OF THE AURORAL BELT BY RADIO MEANS.
Scientific rept.,
by Howard F. Bates. Sep 65, 31p UAG-R-170

Descriptors: (*Aurorae, Electromagnetic wave reflections), (*Radio waves, Ionospheric propagation), (*Ionospheric propagation, Radio waves), Magnetic storms, Diurnal variations, Ionosphere, Electron density, Atmospheric sounding, Radio signals, Backscattering, High frequency.

Backscatter echoes in the high frequency portion of the radio spectrum exhibit a systematic southward movement in the evening and northward in the morning. Typically, the scattering belt lies about 78 degrees N geomagnetic latitude during the day, and moves south to 65 to 70 degrees at night. The extent of the southward movement correlates strongly with geomagnetic activity and, to a lesser degree, local time. No significant difference was found between summer and winter diurnal variations of the scattering belt. The scattering belt has been found to include the optical auroral belt; thus, it is concluded that there is no significant difference in the diurnal variation in the position of the summer and winter auroral belts for given levels of magnetic disturbance. The scattering blt was present on the College magnetic meridian during most of the two and one-half years' observations. This is interpreted as showing the optical auroral belt existed most of the time somewhere on the College meridian, and hence on others as well. Thus, the auroral belt during the solar activity minimum period existed as a more or less closed curve around the geomagnetic pole. When the latitudinal effects are considered versus local time, the auroral belt takes the form of an oval curve, the northernmost portion approximately on the noon meridian. The size of the oval at any time is proportional to the size of the disturbance. (Author)

PB-168 903 **Field 4B**
CFSTI Prices: HC$2.00 MF$0.50
Arizona Univ., Tucson. Inst. of Atmospheric Physics.
METEOROLOGY AND CLIMATOLOGY OF ARID REGIONS. NO. 16. PROBABILITIES OF PRECIPITATION AT SELECTED POINTS IN ARIZONA.
Technical repts.,
by Paul C. Kangieser and Christine R. Green. 15 Apr 65, 49p

Descriptors: (*Atmospheric precipitation, Arizona), Meteorology, Climatology, Deserts, Rainfall, Probability.

This report presents empirical probabilities that the amount of precipitation (inches) during each month of the year will be less than a computed amount. Similar probability values are also presented for the annual series. The probability levels are 10%, 25%, 50%, 75%, 90%, and 95%. The calculations were limited to stations appearing in the publication, Arizona Climate by Green and Sellers, 1964. Only stations from that publication are included which had homogeneous records of at least 25 years length during the period 1934-1963. The total number of such homogeneous stations was 73. (Author)

PB-168 939 **Field 4A, 4B, 22B**
CFSTI Prices: HC$4.00 MF$1.00
Wisconsin Univ., Madison. Dept. of Meteorology.
STUDIES OF LARGE SCALE ATMOSPHERIC ENERGETICS.
Annual rept.,
by A. Carasso, G. Gutman, D. R. Johnson, P. J. Smith, and W. L. Smith. Jun 65, 128p
Grant Cwb-WBG-25

Descriptors: (*Atmospheric sounding, Meteorological satellites), (*Meteorological satellites, Atmospheric sounding), (*Atmospheric motion, Infrared phenomena), (*Infrared radiation, Atmospheric motion), Kinetic energy, Heating, Atmosphere, Meteorology.

The goal of this research is to obtain a better understanding of the mechanisms through which differential heating of the atmosphere produces and maintains the kinetic energy of various scales of atmospheric circulation. The increasing availability of meteorological satellite data is providing on a global scale the observational data necessary to understand the energetics of the atmosphere. Because the satellite radiation measurements have been in the infrared, the studies reported here center on the role of terrestrial radiation in the energy processes. The five studies (1) establish on a firmer basis the relationship between satellite infrared measurements and the divergence of radiation within the atmosphere, (2) describe the areal scale of the time averaged and perturbation part of the infrared radiation field between 50 degrees N and 50 degrees S, (3) investigate the role of infrared cooling in the generation of available potential energy, (4) analyze time series of various energy parameters using variance spectra techniques, and (5) investigate the energy budget of the high level anticyclone found over the Altiplano of South America. (Author)

PB-168 941 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.75
Travelers Research Center, Inc., Hartford, Conn.
MODIFICATION OF THE TRC-USWB BOUNDARY LAYER MODEL.
Final rept.,
by Joseph P. Pandolfo and Gerald Wickham. Nov 65, 72p Rept. no. 7474-180
Contract Cwb-1176

Descriptors: (*Atmosphere models, Boundary layer), (*Boundary layer, Atmosphere models), Atmosphere, Meteorological parameters, Mathematical models, Programming (Computers), Weather forecasting.

Modifications of a previously documented boundary layer model (J. P. Pandolfo, et al., The Development of a Numerical Prediction Model for the Planetary Boundary Layer, 7465-174) are described. These modifications include the use of: (a) the prognostic equations for certain upper-boundary parameters, (b) the prognostic equation for the temperature in the constant-eddy flux layer, (c) an optionally variable surface albedo during any given daylight period, and (d) a more complete formulation for the computation of eddy-fluxes in the lowest portion of the atmosphere's planetary boundary layer. As background to the modified computational procedures, the results of a comparative study of various eddy-flux formulas for constant flux layers in an unstable stratification are presented. A newly-derived set of formulas was found to yield interpolated wind and temperature values that are more accurate than those obtained with previously suggested formulas. Also presented are detailed computational formulas required to incorporate the model changes into our presently-used computer programs. (Author)

PB-168 942 **Field 4B**
CFSTI Prices: HC$4.00 MF$1.00
Travelers Research Center, Inc., Hartford, Conn.
PROGRAM DESCRIPTIONS. SUPPLEMENT TO MODIFICATION OF THE TRC-USWB BOUNDARY LAYER MODEL.
Final rept.,

by Gerald Wickham and Marshall Atwater. Nov 65, 135p Rept. no. 7474-180a
Contract Cwb-11176
See also PB-168 942.

Descriptors: (*Programming (Computers), Meteorological parameters), (*Atmosphere models, Boundary layer), (*Boundary layer, Atmosphere models), Atmosphere, Mathematical models, meteorology, Data processing systems, Weather forecasting.

Two computer programs, Data Generation V and Merge V, are modifications of Data Generation IV and Merge IV, which were prepared for the U. S. Weather Bureau under contract Cwb-10960. These program modifications supplement Modification of the TRC-USWB Boundary Layer Model, by J. P. Pandolfo and G. Wickham for the U. S. Weather Brueau under contract Cwb-11176. Data Generation V stores data for 6-hour prediction periods on magnetic tape in a form acceptable to the radiation and diffusion model equations in Merge V. Merge V is a 6-hour numerical prediction program for x and y wind components, potential temperature, specific humidity, and specific moisture content. Specific moisture content is inferred from the printed-out value for specific water content, used to display more explicitly the presence of cloud with respect to height and time. Appendixes include definitions of symbols, discussion of print-out, other programs used, sample data input forms, and program listings. While this report concentrates on the modifications to the previous programs, complete descriptions of Data Generation V and Merge V are given. (Author)

PB-168 948 **Field 4A, 20N**
CFSTI Prices: HC$1.00 MF$0.50
Alaska Univ., College. Geophysical Inst.
TRACKING THE AURORA BY A MULTIFREQUENCY HF BACKSCATTER SOUNDER.
Scientific rept.,
by H. F. Bates, A. E. Belon, G. J. Romick, andW. J. Stringer. Oct 65, 23p UAG-R-169
Grants NSF-GP-947, NSF-GP-2721

Descriptors: (*Aurorae, Electromagnetic wave reflections), (*Optical tracking, Aurorae), (*Radar tracking, Aurorae), Radio waves, Ionospheric propagation, High frequency, Very high frequency, Backscattering, Magnetic disturbances.

A comparison of simultaneous optical and radio auroral data obtained during 12 days in December, 1964, shows conclusively that the radio wave scattering belt includes the visual auroral belt. The optical data were obtained with the Alaskan network of all-sky-cameras located between 65 and 80 degrees north geomagnetic latitude. With the exception of vertical incidence, meteor, groundscatter, and slant F (polar spur) traces, all of the recorded backscatter traces from the north were scaled indiscriminately for slant range. The excellent agreement that resulted leads us to conclude that the majority of the HF and low VHF backscatter echoes observed at high latitudes are auroral echoes in the strict sense of the term. In the records shown the auroral belt was tracked from 65 to above 80 degrees N geomagnetic latitude. It is concluded that the multifrequency HF backscatter sounder makes year-round observations of the auroral belt possible. (Author)

PB-168 949 **Field 4B, 22B**
CFSTI Prices: HC$2.00 MF$0.50
ARACON Geophysics Co., Concord, Mass.
CLOUD FEATURE PERSISTENCE IN SATELLITE PICTURES AND ITS APPLICABILITY TO WIND DETERMINATION.
Final rept.,
by James R. Greaves, James C. Barnes, Walter P. Smith, and William K. Widger, Jr. Sep 65, 50p Rept. no. 8G15-1
Contract Cwb-10988

Descriptors: (*Cloud cover, Aerial photography), (*Meteorological satellites, Weather forecasting), (*Aerial photography, Cloud cover), (*Weather forecasting, Meteorological satellites), Wind, Clouds, Motion.

Identifiers: TIROS, Nimbus.

Data from overlapping orbits of the TIROS and Nimbus meteorological satellites were studied to determine the frequency with which small identifiable clouds remain recognizable over time periods of one-half to two hours. It was found that usable persistence could be located in approximately 30 percent of the conventional TIROS cases investigated. For the TIROS-Wheel, this number increased to nearly 40 percent. The correlations between identifiable cloud persistance and both geographic location and synoptic situations were investigated. No significant correlation with geographic location could be found. Certain synoptic situations are, however, more likely than others to yield detailed persistence usable in cloud movement computations. A preliminary trial of automation of the measurement of actual orbit-to-orbit movements of clouds was made using a specialized film-reader and an attitude determination program developed by ARACON. It was found that the direction of motion, and in many cases the actual cloud speed, could be readily measured. The conversion from cloud movements to construction of actual wind fields will require further investigation. Recommendations are made for future studies which would eventually lead to wind-field determinations from satellite cloud movement data. (Author)

PB-168 956 **Field 4B**
CFSTI Prices: HC$4.00 MF$0.75
Miami Univ., Coral Gables, Fla. Inst. of Marine Science.
RADAR HURRICANE RESEARCH.
Final rept. 1 Sep 64-31 Aug 65,
by H. V. Senn, J. A. Stevens, and P. J. Davies. Sep 65, 109p Rept. nos. 8184-1, ML-65335
Contract Cwb-10970

Descriptors: (*Hurricane tracking, Meteorological radar), (*Tropical cyclones, Radar scanning), (*Meteorological radar, Hurricane tracking), Marine meteorology, Storms, Rainfall, Radar echo areas, Weather forecasting.

Identifiers: Hurricane Cleo (1964).

Radar hurricane precipitation patterns which have been used as indicators of storm center motion in the past are surveyed. In addition, preliminary studies have been made on a number of other patterns characteristic of hurricanes to determine whether they warrant more thorough investigation. The patterns surveyed include the open eye and its extent and azimuth; a comparison of the height, width, and intensity of the forward and rear sections of the eye wall; the elliptic eye and its rotation; the size of the eye and the significance of changes in it; prehurricane squall lines and their distance and motion with respect to the storm center; carrot-shaped and other squall lines which seem to form only in certain types of storms; the average number of spiral bands in the storm; the crossing angle of spiral bands at various ranges from the eye; the varying velocity, length, tails, and lifetime of the bands; and the position and structure of the rainshield. The three dimensional distribution of precipitation in hurricane Cleo, 1964 is presented using radar precipitation data obtained by University of Miami and U. S. Weather Bureau radars in south Florida. These data include PPI in the normal mode, as well as in stepped-gain and video-inversion IEC modes, PPI taken with varying antenna tilts, and RHI data at closely spaced intervals of time, enabling an unusually complete simultaneous picture of both the horizontal and vertical extent of the hurricane precipitation patterns for at least 24 hours. (Author)

PB-168 958 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.50
Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
A PRELIMINARY STUDY OF THE STRATOSPHERIC WARM BAND OVER NORTH AMERICA.
Masteri's thesis,
by Joseph L. Goldman. Jan 60, 58p
Grant NSF G7367

Descriptors: (*Stratosphere, Atmospheric temperature), (*Atmospheric temperature, Statosphere), Meteorology, Climatology, North America.

Statistics on the geographic position and temperature of the stratospheric warm band at 150, 100 and 50 millibars are determined from bidaily constant pressure analyses for three periods during the winter of 1957-58. The time profiles of temperature at five pressures for six North American stations, which are located at or north of the median position of the warm band, are plotted and examined for some evident relationships. Preliminary results of the studies of time variation and space variation of temperature are presented. (Author)

PB-168 959 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.50
Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
A STUDY OF THE DIURNAL PRESSURE AND TEMPERATURE OSCILLATIONS IN THE ATMOSPHERE BETWEEN 500 MB AND 50 MB.
Master's thesis,
by Victor Shelby Whitehead. Jan 60, 54p
Grant NSF-G7367

Descriptors: (*Atmosphere, Diurnal variations), Barometric pressure, Atmospheric temperature, Oscillation, Atmospheric tides, Atmospheric sounding.

Diurnal oscillations of height and temperature were studied for 500, 300, 150, 100, and 50 mb. Data were used from thirteen stations near 30 degrees N latitude, extending from Wheelus AFB, Tripoli westward to Midway Island in the Pacific. The data were for two fifteen-day periods centered around the winter and summer solstices over a four-year period. The amplitudes of the height and temperature oscillations were found to increase with height. The peak of the temperature oscillations shifts from mid-afternoon at 500 mb to noon at 50 mb. The peak of the height oscillations shifted in a similar manner, but lagged the temperature peak at levels above 300 mb. The winter and summer studies gave quite similar results. Rather good agreement was found between instruments using shielded thermistors and those using exposed thermistors. (Author)

PB-168 960 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.50
Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
A STUDY OF MID-LATITUDE TROPOPAUSE CHARACTERISTICS DURING WINTER.
Master's thesis,
by Norman Johnson Clark. Jan 60, 57p
Grant NSF-G7367

Descriptors: (*Tropopause, Meteorological parameters), (*Atmospheric sounding, Tropopause), Climatology.

An objective tropopause definition is applied to upperair data for December 1957, January 1958, and February 1958 for six stations located along 80 degrees W. Various tropopause parameters are examined with respect to latitude and other atmospheric characteristics; the relationships found are mostly poorer than anticipated. Multiple tropopauses are found to exist at all latitudes, but occur with greatest frequency in the middle and lower middle latitudes. Individual tropopause surfaces are found to exhibit many discontinuities. The U. S. Weather Bureau and WMO tropopause definitions are discussed critically, and the bias introduced into the statistics by those definitions is examined. (Author)

PB-168 961 **Field 4B**
CFSTI Prices: HC$4.00 MF$1.00
Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
AN INVESTIGATION OF THE DISTRIBUTION OF CARBON DIOXIDE BETWEEN THE ATMOSPHERE AND THE SEA.

Technical rept.,
by Edward R. Ibert and Donald W. Hood. 15 Apr 63, 139p Ref-63-9-T
Grants NSF G10188, NSF-Y/9.13/137,
Projs. A and M-146, A and M-234

Descriptors: (*Carbon dioxide, Marine meteorology), (*Marine meteorology, Carbon dioxide), Micrometeorology, Mexico Gulf, Caribbean Sea, Atlantic Ocean, Oceanology.

Measurements of the distribution of CO2 between the atmosphere and the sea are presented with a discription of the apparatus used and its calibration. The measurements were made on a series of cruises into the Gulf of Mexico, the Northern Caribbean Sea and the Western North Atlantic Ocean; in the gas phase using a nondispersive double-beam infrared analyzer.

PB-169 035 **Field 4B, 8B, 22B**
CFSTI Prices: HC$2.00 MF$0.50
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
PROCEDURES FOR GRAPHICAL RECTIFICATION OF TIROS PHOTOGRAPHS.
Rept. no. 3 on Weather Interpretation from Satellite Pictures,
by G. Wooldridge. Aug 65, 34p Atmospheric Science Technical paper TP-71
Contract Cwb-10879,
Proj. WISP

Descriptors: (*Meteorological satellites, Photogrammetry), (*Photogrammetry, Meteorological satellites), (*Weather forecasting, Meteorological satellites), Cloud cover, Aerial photographs, Rectifiers (Photography), Graphics, Geometry.

Identifiers: TIROS, WISP Project.

Graphical rectification procedures for TIROS photographs are reviewed and presented. An example of rectification of a tape mode orbit is performed, and the required steps individually shown. A graphical method is used for making time corrections for the tape mode. Simplified instructions of Fujita's approximate method are given and illustrated by drawings. Data sources and requirements, as well as chart requirements are listed. The accuracy necessary for meteorological research is retained while time requirements are considerably less than Fujita's precise method. (Author)

PB-169 055 **Field 4A**
CFSTI Prices: HC$4.00 MF$0.75
Cosmic Ray Group, Univ. of Minnesota, Minneapolis.
PROJECT POCIBO.
Progress rept.,
by John R. Winckler. Aug 65, 102p CR-81
Supported by a grant from the National Science Foundation.

Descriptors: (*Atmospheric sounding, Meteorological balloons), (*Cosmic rays, Measurement), Airborne, Meteorological instruments, Telemeter systems, Atmosphere, Meteorology, Polar regions.

Identifiers: Pocibo project.

The principal motivation for conducting the Pocibo program is the possibility of obtaining by radio telemetry, scientific data for long periods of time from a balloon near the top of the atmosphere. The Pocibo program is designed to utilize the polar vortex wind system. In this system the balloon would drift around the polar region and would be in continuous radio contact with a number of tracking stations situated in the Arctic. The type of investigations which were originally proposed and for which experiments were constructed and flown on this program include the measurement of low energy primary cosmic rays using particle detectors to separate the isotopes, the measurement of the total cosmic ray ionization, and studies of the time variations and the positional variations of the cosmic radiation at points both close to and somewhat removed from the geomagnetic pole.

PB-169 056 **Field 4B**
CFSTI Prices: HC$4.00 MF$0.75
Florida State Univ., Tallahassee. Dept. of Meteorology.
SATELLITE STUDY, TROPICAL NORTH ATLANTIC, 1963. PART I. SURFACE WIND ANALYSES, JULY 26AUGUST 31.
Final rept., pt. I,
by C. I. Aspliden, G. A. Dean, and H. Landers.
Sep 65, 117p
Grant Cwb-WBG-32

Descriptors: (*Meteorological satellites, Weather forecasting), (*Weather forecasting, Meteorological satellites), (*Air mass analysis, Marine meteorology), (*Marine meteorology, Atlantic Ocean), Meteorological charts.

SC-DC-65-1312 **Field 4A**
CFSTI Prices: HC$4.00 MF$1.00
Sandia Corp., Albuquerque, N. Mex.
CIRCULATION PROCESSES AND MIXING MECHANISMS IN THE UPPER ATMOSPHERE ABOVE 30 KM. SEDIMENTATION AND DISPERSION OF PARTICULATE CLOUDS IN THE UPPER ATMOSPHERE.
Final rept.,
by Owen Cote. Mar 65, 129p
Contract AT (29-1)-789
GCA TR-65-4-G
Subcontracted to GCA Technology Div., GCA Corp., Bedford, Mass. Contract PO-82-6256.

Descriptors: (*Upper atmosphere, Atmospheric motion), (*Clouds, Hydrodynamics).

5. BEHAVIORAL AND SOCIAL SCIENCES

AD-411 981 **Field 5C, 12B**
CFSTI Price: HC$2.00
RAND Corp., Santa Monica, Calif.
MODELS FOR ECONOMIC DEVELOPMENT,
by Frederick T. Moore. Jul 63, 45p P-2734
Prepared for presentation to the NATO Conference on Operational Research in Economics, Palermo, Sicily, 20-28 May 63.

Descriptors: (*Mathematical models, Economics), (*Economics, Mathematical models), Management planning, Optimization.

AD-421 142 **Field 5C, 13B**
CFSTI Price: HC$1.00
RAND Corp., Santa Monica, Calif.
SOME PITFALLS IN THE ANALYSIS OF RESIDENTIAL LOCATIONAL PREFERENCES,
by Eugene F. Brigham. Oct 63, 10p P-2807

Descriptors: (*Urban areas, Selection), (*Population, Attitudes), Housing.

Professor Frieden has provided planners with a valuable tool for analyzing the strength of a metropolitan population's preference for a central residential location. This is a significant contribution, since important decisions involving millions of dollars must or at least should be based on this preference. In illustrating his methodology, however, Frieden commits two errors: he uses a single, atypical sample to represent an entire area, and he fails to take an important factor, the amenity level, into account. As suggested in this paper, these errors of analysis could possibly lead to seriously mistaken decisions, so it is suggested that Frieden's conceptual scheme be modified to employ some form of multivariate analysis. Further, it is urged that extreme care be given to the selection of the sample upon which the analysis is based. With these modifications, studies similar to Frieden's pioneering efforts should provide city and regional planners with many valuable insights into the complex patterns of relationships found in our metropolitan areas.

AD-447 091 **Field 5A, 14D**
CFSTI Price: HC$3.00
Bird Engineering-Research Associates, Inc., Vienna, Va.
COST AND TIME FACTORS RELATING TO RELIABILITY IN DEVELOPMENT PLANNING.
Final rept., Jul 62-Jul 63,
by Ward T. Shields and Robert T. Williams. 1 Oct 63, 76p
Contract NOw-62-0990-c

Descriptors: (*Weapon systems, Management planning), (*Management planning, Weapon systems), (*Guided missiles, Costs), Naval research, Reliability, Time studies, Production control, Quality control, Processing, Feasibility studies, Management engineering, Scheduling, Armed forces budget, Logistics, Military requirements.

The report presents the results of a study to determine the quantitative relationships between cost, time, and reliability in the development of systems or equipment. Systems and equipment studied consisted of a number of types, predominantly electronic, but including several which were electromechanical or mechanicalhydraulic. The report incorporates the results of a separate but related study to establish these relationships for a class of short- to medium-range aerodynamically supported guided missiles. A technique of estimation between combinations of cost/time/reliability is formulated from data collected from the experience of past development programs. The results are arranged as a consecutive step procedure for making such estimations, using graphs and formulae derived from the data. (Author)

AD-467 736 **Field 5I, 15E**
CFSTI Prices: HC$4.00 MF$1.00
Army Logistics Management Center, Fort Lee, Va. Logistics Research and Doctrine Dept.
LOGISTICS TRAINING IN THE ARMY SCHOOL SYSTEM.
Final rept., Dec 63-Jan 65.
Jan 65, 150p Study-11-64

Descriptors: (*Logistics, Army training), (*Army training, Logistics), Army personnel, Research program administration, Management engineering, Manpower studies, Army procurement, Civilian personnel, Reviews.

The study examines and evaluates logistics training in the Army school system and reviews the logistics doctrinal responsibilities of major commands. It evaluates the training and educational opportunities available to civilians, officers, and enlisted personnel by considering the following: Background, adequacy of training, and voids in training. Since a large part of the wholesale logistics system is manned by civilians, much emphasis is placed on their career development. (Author)

N65-30028 **Field 5B**
CFSTI Prices: HC$2.75 MF$1.50
National Aeronautics and Space Administration, Washington, D. C.
GUIDE TO THE SUBJECT INDEXES FOR SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS.
Jun 65, 265p NASA-SP-7016, Rev. 2

Descriptors: (*Subject indexing, Reports), (*Astronautics, Subject indexing).

PB-168 606 **Field 5C, 12A**
CFSTI Prices: HC$3.00 MF$0.50
Princeton Univ., N. J. Econometric Research Program.
A SPECTRAL ANALYSIS OF THE LONG-SWING HYPOTHESIS.
Research memo.,
by E. Philip Howrey. Aug 65, 53p RM-78
Grants NSF-GS-551, NSF-GP-579

Descriptors: (*Economics, Statistical analysis), (*Statistical analysis, Economics), Time, Series, Stochastic processes, Fourier analysis.

Identifiers: Spectral analysis.

This paper is concerned with the existence of long swings in the rate of growth of output and related macroeconomic variables. The usual method which is used to isolate long swings in economic time series is first to low-pass filter the series in order to attenuate the shortrun fluctuations and then to analyze the filtered series. It is shown that inferences about the period of fluctuation of the original series based on estimates obtained from a filtered series may be misleading unless the effect of the filter is considered. Specifically, a major cycle with a periodicity of between eight and eleven years in the original series may appear as a long swing with a periodicity of between fifteen and twenty-five years in the filtered series. This suggests that the results of several earlier studies of the long-swing hypothesis must be interpreted with extreme caution. The empirical results of this paper are presented in the form of estimates of the spectral density functions of the relative rate of growth of a number of macro-economic variables. These estimates indicate that the relative peaks which do emerge in the long-swing frequency band are in most cases extremely weak; in no case are they statistically significant. On the other hand, the major and minor business cycles stand out clearly in these estimates. These estimates, together with the observation that the usual filtering methods can 'shift' a major-cycle peak in the spectrum into a long-swing peak, tend to cast considerable doubt on the existence of long swings in the rate of growth as fluctuations which are distinct from the major cycle. (Author)

PB-168 682 **Field 5B, 8K**
CFSTI Prices: HC$2.00 MF$0.50
Seismological Society of America, San Francisco, Calif.
THE PREFERENCES OF SEISMOLOGISTS FOR THE KWIC INDEX,
by William Mansfield Adams andLawrence C. Lockley. Jul 65, 50p
Grant NSF-GN-95

Descriptors: (*Seismology, Subject indexing), (*Subject indexing, Seismology), (*Information retrieval, Seismology), Documentation, Indexes, Effectiveness.

Identifiers: KWIC index.

For the purposes of this paper a KWIC index is defined as a presentation of titles ordered in such a fashion that the title appears in the listing as many times as it has significant words in the title. Its position in the listing is alphabetical under each of the key words. This alphabetical listing occurs on some column about the middle of the page, permitting those sections of the title leading and following the significant word to be presented to the user on the same line. The user is directed to the item being indexed by a code word terminating or preceding the line. A page of such a KWIC index is given as an illustration.

PB-168 684 **Field 5B, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Diebold Group, Inc., New York.
INFORMATION SYSTEMS AND THE PLANNING PROCESS,
by Donald F. Blumberg. 1962, 14p

Descriptors: (*Information retrieval, State-of-theart reviews), Reports, Indexes, Punched cards, Computers, Magnetic tape, Computer logic, Microfilm, Photographic film, Management planning, Systems engineering.

The paper surveys the State of the Art in Information Storage and Retrieval, and discusses the generic characteristics of approximately 36 systems, which can be classified into three major categories. The purpose of this initial discussion lies in the identification of systems which store and retrieve documents or documents with associated index, as well as systems which simply deal with the index only.

PB-168 884 **Field 5G**
CFSTI Prices: HC$2.00 MF$0.50
California Univ., Berkeley. Machine Translation Project.
THE BASIC PUNCHING CODE FOR RUSSIAN TEXT, R-1 (BPR),
by C. Douglas Jackson. Aug 65, 30p
Grant NSF-F306

Descriptors: (*Russian language, Programming (Computers)), (*Machine translation, Russian language), English language, Punched cards.

The basic punching code for Russian text is to become the chief means of reducing written Russian to machineusable form at the University of California Machine Translation Project. All Russian text used as input to the automatic Russian-to-English translation system being developed will be represented by means of this code. The use of other codes for special purposes (such as preparing textual input to the concordance programs) will be provided by a generalized codeconversion program. Initially, this program will be used to convert the code used heretofore, and soon to be discarded, into the basic punching code. Although of wide applicability, the basic punching code is designed especially for representing the text of the Soviet journal Biokhimiya. Most of the distinctive graphic features of that text, other than features peculiar to structural formulas and diagrams, are provided for in the code. (Author)

PB-168 885 **Field 5B, 9B**
CFSTI Prices: HC$1.00 MF$0.50
American Inst. of Physics, New York. Documentation Research Project.
RESEARCH PROJECT FOR THE EVALUATION OF THE UDC AS THE INDEXING LANGUAGE FOR A MECHANIZED REFERENCE RETRIEVAL SYSTEM: AN INTRODUCTION,
by Robert R. Freeman. 1 Oct 65, 10p AIP/DRP-UDC-1
Grant NSF-GN-433

Descriptors: (*Classification, Information retrieval), (*Subject indexing, Information retrieval), Automatic, English language.

Identifiers: Universal Decimal Classification, Evaluation, Coding (Documentation).

The report describes the five areas of activity which lead toward the aim expressed in the title: (1) to develop a complete English-language version of UDC in both hierarchical and alphabetical arrangement in machine-readable form; (2) to develop techniques for automatic file maintenance and photocomposition of UDC editions; (3) to develop a computer-based reference retrieval system which uses UDC as its indexing language; (4) to collect a set of UDC-indexed document files in machine-readable form in various subject areas; and (5) to conduct tests with the aid of experimental user groups which will lead to an evaluation of the UDC in the desired context. Data are also given on the organization of the project. (Author)

PB-168 931 **Field 5B, 9B**
CFSTI Prices: HC$6.00 MF$1.50
Meteorological and Geoastrophysical Abstracts, Washington, D. C.
MECHANIZATION OF THE UDC,
by Malcolm Rigby. 3 Jun 64, 288p
Grant NSF-GN-131
Document includes PB-166 412, 164 366, 164 368, and 168 327.

Descriptors: (*Information retrieval, Bibliographies), (*Subject indexing, Programming (Computers)), (*Programming (Computers), Information retrieval), Data processing systems, Documentation, Standardization, Languages, Astronomy, Geophysics, Feasibility studies.

Identifiers: Universal Decimal Classification.

A pilot project for the purpose of determining the feasibility, costs and problems involved in mechanical storage, retrieval and printout of Universal Decimal Classification (UDC) schedules in any or all languages, especially in the three official languages (English, French and German) is described. The factors considered were: (1) the procurement of schedules, (2) preparation of copy for punching (including transliteration of Russian and Romanization of Japanese characters), (3) punching and verifying cards, (4) editing (proof) computer run, (5) correcting card file, (6) taping cards, (7) programming for single language, for multilingual presentations and for updating, (8) final computer runs for study or reproduction, (9) reproduction problems, (10) cost analysis for limited sample, for a larger sample or for entire body of UDC schedules, including extensions and corrections. The sample treated, involving 40,000 punched cards, included about 27,000 headings from 3 full editions (English, French and German), 1 intermediate edition (Russian), 4 special editions, and the abridged editions in 12 other languages, using only class 52 (Astronomy and Astrophysics) and class 55 (Geology - Geophysics). (Author)

PB-169 040 **Field 5B, 9B**
CFSTI Prices: HC$3.00 MF$0.75
System Development Corp., Santa Monica, Calif.
A BIBLIOGRAPHY ON INFORMATION SCIENCE AND TECHNOLOGY. PART I,
by Frances Neeland. 20 Aug 65, 65p Technical memo TM-2625/001/00
Contract ADI-65-1

Descriptors: (*Documentation, Bibliographies).

Identifiers: Information sciences, Technology.

The 585 items listed alphabetically by personal or corporate author are also indexed by their source: 55 periodicals for the articles; 79 corporate sources for the technical reports (including the Joint Publications Research Service for translations from the Russian); 8 publishers of the books (including 2 conference proceedings); analytics for 3 conferences and 2 other compilations; 7 U. S. and British patent disclosures. This is the first issue of a bibliography intended primarily for the use of the authors of chapters in the first volume of 'Annual Review of Information Science and Technology,' to be established by the American Documentation Institute. (Author)

6. BIOLOGICAL AND MEDICAL SCIENCES

ABCC-61-62 **Field 6R**
CFSTI Prices: HC$5.00 MF$1.00
Aomic Bomb Casualty Commission, Hiroshima (Japan).
SEVENTH MEETING OF THE JAPANESE ADVISORY COUNCIL TO THE ATOMIC BOMB CASUALTY COMMISSION (ABCC).
Annual rept. 1 Jul 61-30 Jun 62.
1962, 158p
Contract AT (49-1)-GEN-72
Text in Japanese.

Descriptors: (*Nuclear warfare casualties, Japan).

AD-462 102 **Field 6P**
CFSTI Price: HC$1.00
Kentucky Univ., Lexington. Dept. of Physiology and Biophysics.
RESPONSES OF COLD- AND WARM-ADAPTED DOGS TO INFUSED NORADRENALIN AND ACUTE BODY COOLING.
Final rept., Oct 63-Nov 64,
by Tetsuo Nagasaka and Loren D. Carlson. Feb 65, 18p
Contract AF41 (609)-2193,
Proj. 8237,
Task 823702
AAL TR-64-21

Descriptors: (*Acclimatization, Pharmacology), (*Levarterenol, Acclimatization), Dogs, Physiology, Oxygen consumption, Blood

pulse, Heat production (Biology), Cold weather tests, Metabolism, Shivering, Biochemistry, Sensitivity, Tropical tests, Adaptation (Physiology), Skin, Intestines, Hypothermia.

A total of 12 experiments was done in cold-adapted (C-A) and warm-adapted (W-A) beagle dogs, kept more than 40 days at -10 C and 28 C, respectively. The animals, anesthetized with pentobarbital sodium were paralyzed with Flaxedil (5 mg/kg/hour) and mechanically ventilated at 28-30 C. Oxygen consumption, heart rate and colonic, pinna and paw skin temperatures were measured continuously. The dogs were infused with noradrenalin for 20 minutes at 30 C and after 45 minutes of acute cold exposure to 5 C. At 28-30 C, basal oxygen consumption was higher in C-A dogs. Oxygen consumption of C-A dogs increased with a slight increase in the heart rate during the initial 18-20 minutes after body cooling and then decreased. In W-A dogs, oxygen consumption decreased continuously after acute cold exposure. Calorigenic effects of infused noradrenalin were consistent in C-A and W-A dogs at 30 and 5 C, but there was no difference between the increased amount of oxygen consumption from the initial levels in both groups. Nor-adrenalin caused an increase of the heart rate in W-A dogs at 30 and 5 C, with decrease or no change in C-A dogs. Colonic, pinna and paw skin temperatures were significantly higher in C-A than in W-A dogs. Noradrenalin caused an increase in the temperatures, but the effect of the drug was more prominent in W-A than in C-A animals at lower temperature. (Author)

AD-466 881 **Field 6Q, 5E, 5I**
CFSTI Prices: HC$3.00 MF$0.75
Dunlap and Associates, Inc., Darien, Conn.
DEVELOPMENT OF A METHODOLOGY FOR MEASURING INFANTRY PERFORMANCE IN RIFLE FIRING AND RELOADING. DEVELOPMENT OF METHODOLOGY FOR MEASURING EFFECTS OF PERSONAL CLOTHING AND EQUIPMENT ON COMBAT EFFECTIVENESS OF INDIVIDUAL SOLDIERS.
Partial rept. no. 2, Phase 2,
by Alin Gruber, Jack William Dunlap, George DeNittis, Jerrell L. Sanders and Virginia W. Perry.
Jun 65, 62p
Contract DA-19-129-QM-2068,
Proj. USATECOM-8-3-7700-01

Descriptors: (*Protective clothing, Human engineering), Performance (Human), Job analysis, Stress (Psychology), Effectiveness, Firing tests (Ordnance), Small arms, Psychometrics, Experimental data, Handling, Tactical warfare, Simulation.

A three-phase research effort is underway to develop field methology for measuring the effects of experimental clothing and equipment on the combat effectiveness of individual infantrymen. This report describes the work performed to develop a reliable method for measuring soldier performance in the essential ingredients of these tasks under conditions considered representative of combat conditions. A proposed method was tested using a modified Train Fire Range. Trials on the temporary facility demonstrated that the proposed system was sensitive to performance differences resulting from personal equipment worn, such as gloves and gas masks. A refined system is recommended for inclusion in a field course for evaluation in Phase III of the project. (Author)

AD-466 882 **Field 6Q, 5E, 5I**
CFSTI Prices: HC$3.00 MF$0.75
Dunlap and Associates, Inc., Darien, Conn.
DEVELOPMENT OF A METHODOLOGY FOR MEASURING INFANTRY PERFORMANCE IN MARCHING AND MOVING. DEVELOPMENT OF METHODOLOGY FOR MEASURING EFFECTS OF PERSONAL CLOTHING AND EQUIPMENT ON COMBAT EFFECTIVENESS OF INDIVIDUAL SOLDIERS.
Partial rept. no. 4, Phase 2,
by Alin Gruber, Jack William Dunlap, George DeNittis, Jerrell L. Sanders and Virginia W. Perry.
Jun 65, 56p
Contract DA-19-129-QM-2068,
Proj. USATECOM-8-3-7700-01

Descriptors: (*Army personnel, Performance (Human)), Test methods, Terrain, Measurement, Roads, Virginia, Military personnel, Performance (Engineering), Effectiveness, Human engineering, Army operations, Armed forces maneuvers, Simulation.

AD-466 949 **Field 6T, 6A**
CFSTI Prices: HC$1.00 MF$0.50
Army Medical Research Lab., Fort Knox, Ky. Dept. of Biochemistry.
DETOXIFICATION OF THE VENOMS OF THE RUSSELL'S VIPER (VIPERA RUSSELLII) AND WATER MOCCASIN (AGKISTRODON PISCIVORUS) BY PHOTOOXIDATION,
by W. Kocholaty and B. D. Ashley. 12 May 65, 19p Rept. no. 629
Proj. DA-3A014501B71P,
Task 11

Descriptors: (*Venoms, Detoxification), (*Photochemistry, Venoms), (*Immunology, Venoms), Reptiles, Photosensitivity (Biological), Immunity, Antigens + antibodies, Oxidation, Toxicity, Enzymes, Biochemistry, Carboxylic ester hydrolases, Biological stains, Pathology, Musculoskeletal system, Rabbits.

Photooxidation of six venoms of domestic and foreign snakes resulted in the detoxification of all venoms. Immunization of rabbits with two of the detoxified venoms, Agkistrodon piscivorus and Vipers russellii, resulted in the production of antibodies which protected mice against the action of unaltered venom. (Author)

AD-469 244 **Field 6P**
CFSTI Prices: HC$1.00 MF$0.50
Bryn Mawr Coll., Pa. Dept. of Biology.
IRON METABOLISM AND TRYPTOPHAN PYRROLASE ACTIVITY IN ENDOTOXIN-POISONED AND CORTISONE PROTECTED MICE.
Quarterly rept. no. 6, 1 Jun-31 Aug 64,
by George N. Eaves and L. Joe Berry. May 65, 25p
Contract AF41 (609)-1764,
Proj. 8241,
Task 824101
AAL TR-64-27

Descriptors: (*Iron, Metabolism), Toxins + antitoxins, Salmonella, Toxicity, Coenzymes, Tryptophan, Stress (Physiology), Porphyrins, Corticosteroid agents, Temperature, Liver, Blood plasma.

The hypoferremia which follows the intraperitoneal injection of mice with heat-killed Salmonella typhimurium is not mitigated by protection with cortisone given simultaneously. A single injection of cortisone causes a transient hyperferremia. None of these changes in concentration of plasma iron occurs when mice are maintained in a 5C environment during experimental treatment. The alteration in iron metabolism during experimental treatment. The alteration in iron metabolism during endointoxication does not seen to affect the availability of the iron-porphyrin coenzyme of tryptophan pyrrolase. An initial response of mice to injections of endotoxin or cortisone or both is a translocation of hematin, and the availability of hematin permits an increase in tryptophan pyrrolase activity before the stress-mediated induction of the enzyme becomes apparent. The increase in available activator, with the subsequent decrease in amount of normally inactive apoenzyme, occurs at the same rate and to the same extent in mice housed at 5C and 25C. It is suggested that the increased demand for an iron-containing substance in the liver during stress contributes to the accompanying hypoferremia. (Author)

BNL-7939 **Field 6A**
CFSTI Prices: HC$2.00 MF$0.50
New York Univ., N. Y. Dept. of Pharmacology.
EFFECTS OF INSULIN ON LIVER BLYCOGEN SYNTHESIS AND BREAKDOWN IN THE DOG,
by J. S. Bishop, R. Steele, N. Altazuler, and R. C. DeBodo. 1964, 35p
Contract AT (30-2)-GEN-16

Descriptors: (*Glycogen, Synthesis), (*Insulin, Glycolysis).

BNL-8132 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Brookhaven National Lab., Upton, N. Y.
THE PLASMA DISAPPEARANCE OF RADIOACTIVE CYANOCOBALAMIN EFFECT OF PRIOR ADMINISTRATION OF VITAMIN B 12 ANALOGUES,
by L. M. Meyer, L. M. Schiffer, and D. A. White. 1964, 21p
Contract AT (30-2)-GEN-16
Prepared in cooperation with South Nassau Communities Hospital, Oceanside, N. Y.

Descriptors: (*Radiation effects, Vitamin B complex), (*Vitamin B complex, Leukemia).

BNL-8206 **Field 6C**
CFSTI Prices: HC$2.00 MF$0.75
Brookhaven National Lab., Upton, N. Y.
TWENTY-FOUR HOUR DISPERSION OF RAGWEED POLLEN FROM KNOWN SOURCES,
by Gilbert S. Raynor and Eugene C. Ogden. 1964, 73p
Contract AT (30-2)-GEN-16

Descriptors: (*Pollen, Scattering).

BNL-8730 **Field 6A, 6E**
CFSTI Prices: HC$2.00 MF$0.50
Long Island Jewish Hospital, Jamaica, N. Y. Queens Hospital Center Affiliation.
STUDIES ON SERUM BINDING OF VITAMIN B 12 -- MECHANISMS AND CLINICAL IMPLICATIONS,
by Leo M. Meyer. 29 Dec 64, 46p CONF-703-3
Contract AT-30-2-GEN-16
Presented at congress of the International Society of Blood Transfusion, (10th), Stockholm, Sept. 1964. Prepared in cooperation with Brookhaven National Lab., Upton, N. Y.

Descriptors: (*Vitamin B complex, Blood serum).

BNL-8825 **Field 6M**
CFSTI Prices: HC$1.00 MF$0.50
Brookhaven National Lab., Upton, N. Y.
HOMOLOGY AND DIVERGENCE IN GENETIC MATERIAL OF SALMONELLA TYPHIMURIUM AND ESCHERICHIA COLI,
by M. Demerec. 1965, 8p CONF-65090-1
Contract AT (30-2)-GEN-16

Descriptors: (*Enterobacteriaceae, Genetics), Salmonella, Escherichia coli.

BNL-9331 **Field 6R**
CFSTI Prices: HC$2.00 MF$0.50
Brookhaven National Lab., Upton, N. Y.
H3 THYMIDINE (H3TdR) INCORPORATED INTO DNA; DOSIMETRIC AND RADIOBIOLOGICAL CONSIDERATIONS,
by V. P. Bond and L. E. Feinendegen. 1965, 35p CONF-650302-23
Contract AT (30-2)-GEN-16
Presented at IAEA Symposium on Personnel Dosimetry for Accidental High-level Exposure to External and Internal Radiation, Vienna., 29 Mar-2 Apr 1965.

Descriptors: (*Nucleosides, Desoxyribonucleic acids), (*Radiobiology, Nucleosides), (*Desoxyribonucleic acids, Radiobiology).

BNL-9345 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
PATHOGENESIS OF RADIOLESIONS IN THE MATURE CENTRAL NERVOUS SYSTEM,
by Wolfgang Zeman. 1965, 14p CONF-650507-1
Contract AT (30-2)-GEN-16
Prepared for presentation at International Congress of Neuropathology (5th), Zurich. Prepared in cooperation with Indiana Univ. Medical Center Indianapolis. Neuropathology Sect.

Descriptors: (*Central nervous system, Radiation effects), (*Radiation effects, Central nervous system).

BNWL-SA-147 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PLUTONIUM PARTICLE-INDUCED NEOPLASIA OF THE CANINE LUNG. II. HISTOPATHOLOGY AND CONCLUSIONS,
by W. J. Clarke, J. L. Palotay, and W. J. Bair. 13 Apr 65, 18p CONF-650624-1
Contract AT (45-1)-1830
Prepared for presentation to International Conference on Lung Tumors in Animals (2nd), Perugia, Italy.

Descriptors: (*Radiation effects, Lungs), (*Lungs, Neoplasms).

BNWL-SA-230 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PLUTONIUM PARTICLE-INDUCED NEOPLASIA OF THE CANINE LUNG. I. CLINICAL AND GROSS PATHOLOGY,
by J. F. Park, W. J. Clarke, and W. J. Bair. 24 Jun 65, 20p CONF-650624-2
Contract AT (45-1)-1830
Presented at International Conference on Lung Tumors in Animals (2nd), Perugia, Italy.

Descriptors: (*Radiation effects, Neoplasms), (*Plutonium, Neoplasms), (*Neoplasms, Lungs).

BNWL-SA-78 **Field 6T**
CFSTI Prices: HC$1.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
THE USE OF TISSUE CULTURE AND CYTOCHEMICAL TECHNIQUE IN TOXICOLOGIC RESEARCH,
by W. J. Clarke, J. L. Palotay, and D. D. Mahlum. 1 Mar 65, 18p CONF-650113-1
Contract AT (45-1)-1830
Presented at Western States Veterinary Conference, Las Vegas, Nev.

Descriptors: (*Tissue culture, Toxicity), (*Cytochemistry, Toxicity).

COO-38-369 **Field 6C**
CFSTI Prices: HC$2.00 MF$0.50
Notre Dame Univ., Ind. Dept. of Biology.
GENETICS AND THE PHILOSOPHY OF BIOLOGY.
by A. E. Manier and H. A. Bender. 1 Oct 64, 38p
Contract AT (11-1)-38
Prepared in cooperation with Notre Dame Univ., Ind. Dept. of Philosophy.

Descriptors: (*Genetics, Theory), (*Biology, Theory).

DPSPU-63-30-37 **Field 6R, 6J**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
ASSESSMENT OF TRITIUM IN PRODUCTION WORKERS,
by F. E. Butler. Mar 64, 17p CONF-448-35
Contract AT (07-2)-1
Prepared for presentation to IAEA Symposium of the Assessment of Radioactive Body Burdens in Man, Heidelberg, Ger., May 1964.

Descriptors: (*Tritium, Health physics).

DPSPU-64-30-7B **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
SAVANNAH RIVER PLANT WHOLE BODY COUNTER CALIBRATION AND OPERATION,
by J. R. Watts, S. M. Sanders, Jr., and C. N. Wright. May 64, 12p CONF-642-25
Contract AT (07-2)-1
Prepared for presentation to Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Radiation measurement systems, Health physics), (*Health physics, Radiation measurement systems).

DPSPU-64-30-9 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
OBSERVATION OF BIOLOGICAL HALF LIFE OF TRITIUM,
by H. L. Butler and J. H. Leroy. May 64, 9p CONF-642-24
Contract AT (07-2)-1
Prepared for Presentation at Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Tritium, Half life), (*Radiobiology, Tritium).

HW-SA-3338 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
ENVIRONMENTAL EVALUATION OF AN ACUTE RELEASE OF I-131 TO THE ATMOSPHERE,
by J. K. Soldat. 10 Jun 64, 19p CONF-642-29
Contract AT (45-1)-1350
Prepared for presentation at Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Reactor accidents, Radiation hazards), (*Radiation hazards, Environment), (*Health physics, Radiological contaminanation).

HW-SA-3359 **Field 6C**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
BIRD SURVEYS IN COTTONWOOD-WILLOW COMMUNITIES IN WINTER,
by W. H. Rickard. 10 Feb 64, 8p
Contract AT (45-1)-1350

Descriptors: (*Birds, Ecology).

HW-SA-3392 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
THE ACCUMULATION OF FALLOUT CESIUM-137 IN NORTHERN ALASKAN NATIVES,
by W. C. Hanson and H. E. Palmer. 3 Mar 64, 20p
Contract AT (45-1)-1350

Descriptors: (*Radioactive fallout, Alaska), (*Radiobiology, Alaska).

HW-SA-3402 **Field 6C, 18C**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
CANOPY-COVERAGE OF THE DESERT SHRUB VEGETATION MOSAIC OF THE NEVADA TEST SITE,
by W. H. Rickard and Janice C. Beatley. 6 Mar 64, 18p
Contract AT (29-2)-517

Descriptors: (*Nuclear explosions, Ecology), (*Plants (Botany), Nuclear explosions).

HW-SA-3454 **Field 6C**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
DEMISE OF SAGEBRUSH THROUGH NATURAL SOIL CHANGES,
by W. H. Richard. 31 Mar 64, 10p
Contract AT (45-1)-1350

Descriptors: (*Plants (Botany), Soils), (*Soils, Plants (Botany)), (*Ecology, Plants (Botany)).

HW-SA-3540 **Field 6C**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
A NOTE ON THE MATING RITUAL AND BIOLOGY OF ELEODES HISPILABRIS CONNEXALE C. (COLEOPTERA, TENEBRIONIDAE),
by L. E. Haverfield. 22 May 64, 5p
Contract AT (45-1)-1350

Descriptors: (*Coleoptera, Reproduction (Physiology)).

HW-SA-3556 **Field 6C**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PITFALL TRAPPING SURVEY OF AUTUMN-EMERGING DARKLING BEETLES IN DESERT STEPPE VEGETATION,
by W. H. Rickard and L. E. Haverfield. 28 May 64, 17p
Contract AT (45-1)-1350

Descriptors: (*Coleoptera, Collecting methods).

HW-72229 (rev) **Field 6R, 18D**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
DOSE-RATE MEASUREMENTS ON BEACHES AND ISLANDS ON THE COLUMBIA RIVER BETWEEN RINGOLD AND RICHLAND,
by D. McConnon. 10 Aug 62, 22p
Contract AT (45-1)-1350

Descriptors: (*Radiological contamination, Rivers), (*Beaches, Radiological contamination), Dose rate.

LA-DC-6506 **Field 6C, 6E**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
SYNCHRONIZED MAMMALIAN CELLS. I. AN IM- PROVED METHOD OF STUDY BY ELECTRONIC CELL COUNTING,
by D. F. Peterson and E. C. Anderson. 1964, 7p
Contract W-7406-eng-36

Descriptors: (*Tissue culture cells, Counting methods).

N65-22180 **Field 6H, 6A**
CFSTI Prices: HC$1.00 MF$0.50
Florida State Univ., Tallahassee. Institute for Space Biosciences.

POTENTIALITIES OF PROTEINOIDS FOR NUTRITIONAL INVESTIGATION,
by Sidney W. Fox, Kaoru Harada, GottfriedKrampitz, Tadao Hayakawa, and Charles Ray Windsor.
1964, 16p FU-RC-7
Grant NsG-173-62
NASA CR-56268
Microfilmed from best available copy.

Descriptors: (*Proteins, Synthesis), (*Nutrition, Space medicine).

N65-33830 **Field 6S**
CFSTI Prices: HC$1.00 MF$1.00
National Aeronautics and Space Administration, Washington, D. C.
AEROSPACE MEDICINE AND BIOLOGY--A CONTINUING BIBLIOGRAPHY, JULY 1965.
Aug 65, 143p NASA-SP-7011 (14)

Descriptors: (*Space medicine, Bibliographies), (*Space biology, Bibliographies).

N65-34001 **Field 6L**
CFSTI Price: MF$0.75
National Aeronautics and Space Administration, Washington, D. C. Technology Utilization Div.
MEDICAL AND BIOLOGICAL APPLICATIONS OF SPACE TELEMETRY.
Technology utilization rept.
Jul 65, 72p NASA-SP-5023
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.

Descriptors: (*Space medicine, Telemeter systems), (*Telemeter systems, Space medicine).

N65-34428 **Field 6E**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Washington D. C.
THE STATE-OF-THE-ART OF ELECTROENCEPHALOGRAPHY AND ITS ROLE IN MANNED SPACE FLIGHT,
by J. F. Herrick. 21 Jun 65, 21p NASA-TM-X-57000

Descriptors: (*Electroencephalography, State-of-theart reviews), (*Space medicine, Electroencephalography).

NYO-1397-1 **Field 6P**
CFSTI Prices: HC$4.00 MF$0.75
Jefferson Medical Coll., Philadelphia, Pa.
STUDIES ON METABOLIC RESEARCH,
Annual rept.,
by F. William Sunderman. 15 May 65, 103p
Contract AT (30-1)-1397

Descriptors: (*Metabolism, Scientific research).

NYO-1864-21 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Philadelphia General Hospital, Pa.
THE EFFECT OF X-RAY IRRADIATION ON PHOSPHOLIPID METABOLISM.
Progress rept. 1 Oct 64-31 May 65,
by Henry P. Schwarz. 31 May 65, 19p
Contract AT (30-1)-1864

Descriptors: (*Phospholipids, Metalbolism), (*Metabolism, Radiation effects).

NYO-1913-1 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
State Univ. of New York, Brooklyn. Downstate Medical Center.
EFFECTS OF IRRADIATION ON THE CALCIFYING MECHANISM OF EPIPHYSEAL CARTILAGE.
Final rept.,
by Albert Hirschman. 14 Feb 62, 10p
Contract AT (30-1)-1913

Descriptors: (*Radiation effects, Cartilage), (*Cartilage, Radiation effects).

NYO-2628-1 **Field 6R, 6M**
CFSTI Prices: HC$1.00 MF$0.50
Jefferson Medical Coll., Philadelphia, Pa.
REDUCTION OF POST-IRRADIATION INFECTIONS BY REPLACEMENT OF THE NORMAL ENTERIC FLORA AND BY SPECIFIC IMMUNIZATION.
Final rept. for 1 Aug 60-30 Sep 64,
by Rolf Freter. 30 Sep 64, 12p
Contract AT (30-1)-2628

Descriptors: (*Enterobacteriaceae, Radiation effects), (*Infections, Radiation effects), (*Immunity, Radiation effects).

NYO-3267-2 **Field 6R**
CFSTI Prices: HC$2.00 MF$0.50
Massachusetts General Hospital, Boston. Physics Research Lab.
USE OF ISOTOPES AND SLOW NEUTRONS IN DIAGNOSIS AND TREATMENT OF NEOPLASMS,
965, 45p
Contract AT (30-1)-3267

Descriptors: (*Neoplasms, Diagnosis), (*Radiotherapy, Neoplasms).

NYO-3273-5 **Field 6R, 6H**
CFSTI Prices: HC$1.00 MF$0.50
Brazil Univ., Rio de Janeiro. Instituto de Biofizica.
SURVEY OF RADIOACTIVE CONTENT OF FOOD GROWN ON BRAZILIAN AREAS OF HIGH NATURAL RADIOACTIVITY,
by E. Penna Franca, C. Costa Ribeire, M. Teitakowski, and H. A. Albuquerque. 1965, 15p
CONF-650523-2
Contract AT (30-1)-3273
Prepared for presentation at Symposium on Radiation and Terrestrial Ecosystems, Richland, Wash.

Descriptors: (*Radioactivity, Food), (*Food, Radioactivity), Brazil.

NYO-3273-6 **Field 6R**
CFSTI Prices: HC$4.00 MF$1.00
Brazil Univ., Rio de Janeiro. Instituto de Biofisica.
RADIOCHEMICAL AND RADIOECOLOGICAL STUDIES ON BRAZILIAN AREAS OF HIGH NATURAL RADIATION,
by E. Penna Franca. 30 Apr 65, 143p
Contract AT (30-1)-3273

Descriptors: (*Radioactivity, Ecology), (*Brazil, Radioactivity).

NYO-3364-5 **Field 6R**
CFSTI Prices: HC$2.00 MF$0.50
Norsk Hydros Inst. for Cancer Research, Oslo (Norway).
CESIUM-137 IN MILK IN NORWAY 1962-1965,
by Kjell Madshus, Aksol Stroemme andKristian Koren. 1965, 42p
Contract AT (30-1)-3364-5
Prepared in cooperation with Norsk Radiumhospital, Oslo. Statens Radiologisk-Fysiske Laboratorium, Oslo (Norway).

Descriptors: (*Milk, Radioactive isotopes), (*Radioactive isotopes, Cesium).

ORNL-P-1405 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
'BETA-TYPE' ABSORBED DOSE FROM NON-BETAEMITTING RADIONUCLIDES,
by C. Craig Harris. 1964, 4p CONF-650313-3
Contract W-7405-eng-26
Prepared for presentation at Symposium on Nuclear Medicine, Philadelphia.

Descriptors: (*Radiobiology, Radiological dosage), (*Radiological dosage, Medical research).

ORNL-P-1446 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
THE IMPORTANCE OF DOSIMETRY TO THE MEDICAL MANAGEMENT OF PERSONS ACCIDENTALLY EXPOSED TO HIGH LEVELS OF RADIATION,
by Gould A. Andrews, John A. Auxier, andC. C. Lushbaugh. 1964, 14p CONF-650302-22
Contract W-7405-eng-26
Presented at IAEA symposium on personnel dosimetry for accidental high-level exposure to external and internal radiation, Vienna.

Descriptors: (*Radiation injuries, Therapy).

ORNL-P-1481 **Field 6R**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
CURRENT PROBLEMS IN THE THEORY OF RADIATION DAMAGE,
by D. K. Holmes. May 65, 47p CONF-650904-8
Contract W-7405-eng-26
Prepared for presentation at Symposium on Radiation Effects, Asheville, N. C.

Descriptors: (*Radiation effects, Theory).

ORNL-P-262 **Field 6C**
CFSTI Prices: HC$3.00 MF$0.75
Oak Ridge National Lab., Tenn.
EFFECTS OF POPULATION DENSITY ON GROWTH RATES OF ANIMAL POPULATIONS,
by James T. Tanner. 29 Jul 64, 52p
Contract W-7405-eng-26

Descriptors: (*Animals, Population), (*Population, Growth).

Patent 3,218,307 **Field 6H, 11G**
PROCESS OF PRODUCING SOYBEAN PROTEINATE.
Patent assigned to Agriculture,
by Arthur C. Eldridge and Arlo Nash. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Proteins, Production), (*Food, Gels), (*Gels, Proteins), Separation, Foams, Adhesives, Colloids, Films, Coatings, Patents.

The products are used to prepare thero-reversible hydrogels for human consumption and to form exceptionally stable whips. The products are obtained by treating (extracting) the acid-precipitated (isoelectric) soybean protein fraction obtained by acidifying the separated aqueous supernatant of a neutral or slightly alkaline aqueous dispersion or slurry of hexaneextracted soybean meal with a lower alcohol or an aqueous solution thereof.

PB-168 636 **Field 6D, 12A, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Lockheed Missile and Space Co., Palo Alto, Calif. Electronic Sciences Lab.
AN EXPERIMENTAL INVESTIGATION OF A CLASS OF PATTERN RECOGNITION SYNTHESIS ALGORITHMS.
Revised ed.,
by R. L. Mattson, O. Firschein, and M. Fischler.
19 Feb 63, 7p
IEEE Transactions on Electronic Computers vEC-13 p300-6 Jun 63. Revision of manuscript submitted 19 Nov 62.

Descriptors: (*Pattern recognition, Decision theory), (*Decision theory, Pattern recognition), Computer logic, Linear systems, Algorithms, Adaptive systems.

This paper discusses a class of pattern-recognition decision-making procedures which can be efficiently mechanized by a network of linear threshold devices. A theoretical discussion of four decision techniques (which are members of the abovementioned class) is augmented by an experimental program which investigates questions not amenable to analysis. (Author)

PB-168 637 **Field 6E, 6M**
CFSTI Prices: HC$2.00 MF$0.50
Baltimore Biological Lab., Md.
PREPARATION OF MYCOPLASMA ANTIGENS AND ANTISERA.
Semi-annual progress rept., 1 Mar-1 Sep 65,
by Norman F. Robillard. 1 Sep 65, 27p
Grant PHS-PH43-62-839

Descriptors: (*Mycoplasma, Antigens + antibodies), (*Immune serums, Mycoplasma), (*Pleuropneumonia-like organisms, Immune serums), Preparation, Immunity, Culture media, Tissue culture, Serodiagnosis.

PB-168 793 **Field 6H, 14B**
CFSTI Prices: HC$4.00 MF$0.75
Public Health Service, Washington, D. C. Div. of Environmental Engineering and Food Protection.
EVALUATION OF MILK LABORATORIES.
1965, 110p PHS-Pub-999-FP-3

Descriptors: (*Milk, Laboratories), (*Laboratories, Milk), Public health, Standards, Safety, Microorganisms, Viability, Biological contamination, Test methods, Sampling, Statistical analysis.

Procedures for collection of sampling and laboratory survey data, establishment of an acceptable split sample program and statistical analysis of split sample results, and other administrative practices in state approval of milk laboratories are summarized.

PB-168 893 **Field 6E, 15B**
CFSTI Prices: HC$4.00 MF$0.75
Chemical Corps Medical Labs., Army Chemical Center, Md.
CONFERENCE ON MECHANICAL ARTIFICIAL RESPIRATION, HELD AT THE BABIES HOSPITAL, COLLEGE OF PHYSICIANS AND SURGEONS, COLUMBIA UNIVERSITY, NEW YORK CITY, 9 DECEMBER 1953.
Special rept.
Mar 54, 104p MLSR-38
Proj. CMLRE-ML-52
AD 28 487

Descriptors: (*Artificial respiration, Symposia), Poisonous gases, Cholinesterase inhibitors, Parathion, Lungs, Edema, Respiration, Medical equipment, Respirators, Tissues (Biology), Absorption (Biological), Poisoning, Chemical warfare agents, Dogs.

Contents: A case of severe anticholinesterase poisoning; Effect and treatment of parathion and nerve gas poisoning in man; Measurement of pulmonary edema and the effect of negative pressure respiration; Use of a single apparatus for giving artificial respiration to more than one patient; Physiological evaluation of mechanical respirators; Use of different types of portable mechanical resuscitators in anesthetized dogs, before and after a circulatory stress; Uptake of soluble gases by tissues surrounding the respiratory dead space.

TID-18616 **Field 6R**
CFSTI Prices: HC$0.50 MF$0.75
Kansas Univ., Lawrence.
LABORATORY EXPERIMENTS IN RADIATION BIOLOGY,
by Edward I. Shaw. Apr 65, 85p
Contract AT (11-1)-1093

Descriptors: (*Radiobiology, Scientific research).

TID-19014 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Minnesota Univ., (St. Paul).
AN EVALUATION OF QUANTITATIVE RADIOAUTOGRAPHY USING LIQUID SCINTILLATION BETA SPECTROMETRY.
Progress rept.,
by Bertram F. Woolfrey. 15 Jun 63, 10p
Contract AT (11-1)-1089

Descriptors: (*Autoradiography, Beta-ray spectroscopy).

TID-21017 **Field 6A, 7E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, MD. School of Hygiene and Public Health.
PHOTOCHEMISTRY OF THYMINE IN AQUEOUS SOLUTION,
by Raul Alcantara and Shih Yi Wang. 1963, 9p
Contract AT (30-1)-1822

Descriptors: (*Nucleotides, Photochemistry), (*Pyrimidines, Photochemistry).

Identifiers: Thymine.

TID-21177 **Field 6E**
CFSTI Prices: HC$1.00 MF$0.50
Atomic Bomb Casualty Commission, Hiroshima (Japan).
SUBACUTE NECROTIZING ENCEPHALOMYELOPATHY. A CASE REPORT WITH SPECIAL EMPHASIS ON THE ASSOCIATED PATHOLOGY OF THE PERIPHERAL NERVOUS SYSTEM,
by Hideo Namiki. 1960, 22p
Contract AT (49-1)-GEN-72

Descriptors: (*Peripheral nervous system, Pathology), (*Brain, Necrosis).

TID-21564 **Field 6R, 6A**
CFSTI Prices: HC$1.00 MF$0.50
Texas Univ., Dallas. Southwestern Medical School.
RADIOBIOLOGICAL SIGNIFICANCE OF B-AMINO- ISOBUTYRIC ACID.
Final rept. for May 1 63-Apr 30 64,
by Henry Lanz. 30 Apr 64, 8p
Contract AT (40-1)-2731

Descriptors: (*Radiobiology, Amino acids), (*Amino acids, Excretion).

Identifiers: Aminoisobutyric acids.

TID-21856 **Field 6A**
CFSTI Prices: HC$1.00 MF$0.50
Oregon Univ., Portland. Medical School.
AN ORDERED TRIPLET CODE FOR MESSENGER RNA WITH NO TWO TRIPLETS CODING FOR THE SAME AMINO ACID,
by Edwin E. Osgood. 1964, 14p
Contract AT (45-1)-581

Descriptors: (*Amino acids, Biosynthesis), (*Ribonucleic acids, Identification).

TID-22023 **Field 6C, 6F**
CFSTI Prices: HC$5.00 MF$1.00
Louisville Univ., Ky. Dept. of Biology.
SOME ASPECTS OF THE LIFE HISTORY OF THE BANDED SCULPIN, COTTUS CAROLINAE CAROLINAE, IN DOE RUN, MEADE COUNTY, KENTUCKY.
Final rept.,
by James E. Craddock. 1965, 193p
Contract AT (40-1)-2595

Descriptors: (*Fishes, Life cycle), (*Life cycle, Fishes).

TID-22033 **Field 6F, 6C**
CFSTI Prices: HC$3.00 MF$0.50
Louisville Univ., Ky. Dept. of Biology.
AGE AND GROWTH OF THE NORTHERN HOG SUCKER, HYPENTELIUM NIGRICANS IN DOE RUN, MEADE, COUNTY, KENTUCKY,
by Richard H. Goodyear. 1965, 54p
Contract AT (40-1)-2595

Descriptors: (*Aquatic animals, Ecology), (*Ecology, Aquatic animals).

TID-22065 **Field 6F**
CFSTI Prices: HC$4.00 MF$1.00
Louisville Univ., Ky. Dept. of Biology.
COMPARATIVE ECOLOGY OF THE CRAYFISHES ORCONECTES RUSTICUS RUSTICUS AND CAMBARUS TENEBROSUS IN DOE RUN, MEADE COUNTY, KENTUCKY,
Rudolph Prins. 1964, 137p
Contract AT (40-1)-2595

Descriptors: (*Marine biology, Ecology), (*Ecology, Marine biology).

UCRL-16177 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
CONSTRUCTION OF A GROWTH CURVE FOR MAMMARY FIBROADENOMA IN THE FEMALE RAT,
by Patricia W. Durbin, Nylan Jeung, Marilyn H.Williams, and James S. Arnold. 3 Jun 65, 20p
Contract W-7405-eng-48

Descriptors: (*Neoplasms, Mammary glands), (*Mammary glands, Neoplasms).

UR-666 **Field 6R**
CFSTI Prices: HC$3.00 MF$0.75
Rochester Univ., N. Y. Atomic Energy Project.
MITOCHONDRIA AND RADIATION SENSITIVITY CELLS,
by E. Tsinga and G. W. Casarett. 13 Apr 65, 76p
Contract W-7401-eng-49

Descriptors: (*Radiation effects, Mitochondria), (*Mitochondria, Radiation effects).

7. CHEMISTRY

AD-414 941 **Field 7D, 1A**
CFSTI Prices: HC$1.00
Dow Chemical Co., Midland, Mich. ARPA Lab.
MASS SPECTRAL STUDIES OF KINETICS BEHIND SHOCK WAVES. I. THERMAL DISSOCIATION OF CHLORINE,
by R. W. Diesen and W. J. Felmlee. Aug 63, 23p
Dow-AR-28-63
Contracts AF33 (616)-6149, Nonr-3814 (00)
Sponsored by ARPA.

Descriptors: (*Chlorine, Pyrolysis), (*Shock waves, Reaction kinetics), Mass spectroscopy, Shock tubes, Thermodynamics, Heat of activation.

The coupling of a shock tube to a time-of-flight mass spectrometer for the determination of kinetic data is described whereby analysis is performed every 25 microsecond. The rate of dissociation of Cl2 has been measured over the temperature range 1700-3200K. under essentially isothermal and isobaric conditions with the observed rate constants in fair agreement with those obtained by the spectroscopic technique. The observed temperature dependence is less than predicted by simple

colli on theory with an apparent activation energy of 41±5 kcal./mole. (Author)

BNL-8836 **Field 7E, 7A**
CFSTI Prices: HC$2.00 MF$0.50
Brookhaven National Lab., Upton, N. Y.
PROGRESS IN CHEMONUCLEAR AND RADIATION CHEMICAL PROCESS DEVELOPMENT,
by Meyer Steinberg. Jan 65, 47p
Contract AT (30-2)-GEN-16
Prepared for presentation at Radiation Chemistry Plendry Session, Moscow, 12-18 Jul 1965.

Descriptors: (*Radiation chemistry, Reviews).

BNL-9200 **Field 7C**
CFSTI Prices: HC$1.00 MF$0.50
Brookhaven National Lab., Upton, N. Y.
THE ROLE OF OXYGEN IN SOLID STATE POLYMERIZATION. I. ACRYLAMIDE AND ITS SOLID SOLUTIONS,
by George Adler. 18 May 65, 25p
Contract AT (30-2)-GEN-16

Descriptors: (*Oxygen, Polymerization), (*Amides, Polymerization).

Identifiers: Acrylamides.

BNWL-SA-134 **Field 7A**
CFSTI Prices: HC$2.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
DESALINATION OF SEA WATER,
by H. Harty. 12 Apr 65, 32p CONF-650432-1
Contract AT (45-1)-1830
Presented at General Conference of PacificNorthwest Trade Association (53rd), Portland, Ore.

Descriptors: (*Sea water, Desalination), (*Desalination, Reviews).

BNWL-SA-213 **Field 7C, 7D**
CFSTI Prices: HC$1.00 MF$0.50
Batelle-Northwest, Richland, Wash. Pacific Northwest Lab.
INTRAMOLECULAR HYDROGEN BONDING TO PIELECTRONS IN SUBSTITUTED PHENOLS,
by W. E. Kedar. 2 Jun 65, 5p CONF-650613-3
Contract AT (45-1)-1830
Presented at American Chemical Society, Northwest Regional Meeting (20th), Corvallis, Ore.

Descriptors: (*Phenols, Chemical bonds), (*Chemical bonds, Phenols).

HW-83299 **Field 7A, 7E**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
HAZARDS REVIEW PROMETHIUM PURIFICATION DEMONSTRATION FACILITY,
by J. S. Buckingham. 15 Jul 64, 12p
Contract AT (45-1)-1350

Descriptors: (*Promethium, Purification).

HW-84250 **Field 7D**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
GAMMA SPECTROMETER FOR USE IN WHOLE BODY COUNTING,
by E. M. Sheen. Oct 64, 19p
Contract AT (45-1)-1350

Descriptors: (*Gamma counters, Whole body irradiation).

IS-T-11 **Field 7B, 7D**
CFSTI Prices: HC$3.00 MF$0.50
Ames Lab., Iowa State Univ. of Scienc and Tech.
OXIDATION STATES OF THORIUM IN FUSED LICLKCL EUTECTIC.
Doctoral thesis,
by Charles Harvey Dock. Feb 65, 90p
Contract W-7405-eng-82

Descriptors: (*Thorium compounds, Chlorides), (*Phase studies, Thorium).

LA-DC-6439 **Field 7D, 9B, 12A**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
MONTE CARLO EXPERIMENTS IN GAS KINETICS,
by Don L. Bunker. 1964, 21p
Contract W-7405-eng-36

Descriptors: (*Monte Carlo method, Kinetic theory), (*Kinetic theory, Digital computers).

LA-DC-6899 **Field 7B, 7E**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
PREPARATION AND PROPERTIES OF SOME ALKALI FLUORIDE COMPLEXES OF PENTAVALENT PROTACTINIUM,
by L. B. Asprey, R. A. Penneman and F. H. Kruse. 1964, 9p CONF-650701-3
Contract W-7405-eng-36
Prepared for presentation at Colloquium on Physical Chemistry of Protactinium, Paris, 2-8 July 1965.

Descriptors: (*Protactinium compounds, Complex compounds).

LA-DC-6900 **Field 7B, 7D**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
FLUORIDE COMPLEXES OF TETRAVALENT PROTACTINIUM,
by L. B. Asprey and R. A. Penneman. 1964, 9p CONF-650701-4
Contract W-7405-eng-36
Prepared for presentation at Colloquium on Physical Chemistry of Protactinium, Paris, 2-8 Jul 1965.

Descriptors: (*Complex compounds, Protactinium compounds).

LA-DC-6926 **Field 7D, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE VAPOR PRESSURE OF PLUTONIUM,
by Robert N. R. Mulford. 1965, 14p CONF-65-704-3
Contract W-7405-eng-36
Presented at IAEA Symposium on Thermodynamics, Vienna.

Descriptors: (*Plutonium, Vapor pressure), (*Liquid metals, Plutonium).

LADC-6485 **Field 7B**
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
VIBRATIONAL SPECTRA, FORCE CONSTANTS, AND BONDING IN MIXED CYANIDE-HALIDE COMPLEXES OF GOLD,
by Llewellyn H. Jones. 1964, 29p
Contract W-7405-eng-36

Descriptors: (*Gold compounds, Spectroscopy), (*Cyanides, Gold compounds), (*Halides, Gold compounds).

N65-20419 **Field 7D, 10C**
CFSTI Prices: HC$1.00 MF$0.50
Brigham Young Univ. Provo, Utah. Dept. of Chemistry.
STUDIES OF REACTION GEOMETRY IN OXIDATION AND REDUCTION OF THE ALKALINE SILVER ELECTRODE,
by Eliot A. Butler. Feb 65, 18p
Contracts NAS7-100, JPL-AE4-310901
NASA CR-57644

Descriptors: (*Electrodes, Oxidation-reduction reactions).

NYO-2047-30 **Field 7E, 7B**
CFSTI Prices: HC$4.00 MF$1.00
Connecticut Univ., Storrs. Dept. of Physics.
INVESTIGATIONS OF RADIATION EFFECTS IN METAL OXIDES AND AZIDES BY ELECTRON SPIN RESONANCE.
Progress rept. for 1 Feb 64-31 Jan 65,
by Ralph H. Bartram and Otis R. Gilliam. 31 Jan 65, 132p
Contract AT (30-1)-2047

Descriptors: (*Oxides, Radiation damage), (*Azides, Radiation damage).

NYO-3000-7 **Field 7D, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Vermont Univ., Burlington.
THE ABSORPTION OF HYDROGEN AND DEUTERIUM BY PALLADIUM-RICH ALLOYS.
Progress rept. Jun 1 64-Jun 1 65,
by Ted B. Flanagan. 1 Jun 65, 24p
Contract AT (30-1)-3000

Descriptors: (*Palladium alloys, Absorption), (*Hydrogen, Palladium alloys), Deuterated.

NYO-3041-1 **Field 7D**
CFSTI Prices: HC$1.00 MF$0.50
Pennsylvania Univ., Philadelphia. Dept. of Chemistry.
ISOTOPE EFFECTS IN ELIMINATION REACTIONS.
Final rept.,
by Louis J. Steffa, Lipot Pentz, and Edward R. Thornton. Jun 65, 17p
Contract AT (30-1)-3041

Descriptors: (*Elimination reactions, Isotopes), (*Isotopes, Elimination reactions).

ORNL-P-1256 **Field 7D**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
A SURVEY OF E1 TRANSITIONS IN THE RARE-EARTH REGION,
by W. B. Ewbank. 1965, 13p CONF-650525-3
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Internal Conversion Process, Nashville, Tenn., 10-13 May 1965.

Descriptors: (*Rare earth elements, Nuclear energy levels).

ORNL-TM-1143 **Field 7A, 18L**
CFSTI Prices: HC$2.00 MF$0.75
Oak Ridge National Lab., Tenn.
A 3500-Mw (t) LOW-TEMPERATURE SODIUM-COOLED FAST BREEDER REACTOR FOR DESALINATION,
by R. C. Olson, H. S. Carlsmith, and R. E. Hoskins. 10 Jun 65, 67p
Contract W-7405-eng-26

Descriptors: (*Desalination, Breeder reactors), (*Breeder reactors, Fast reactors).

TID-20467 **Field 7E, 8G**
CFSTI Prices: HC$1.00 MF$0.50
Texas Agricultural and Mechanical Univ., College Station. Activation Analysis Research Lab.
ACTIVATION ANALYSIS AS APPLIED TO THE PETROLEUM EXPLORATION INDUSTRY,
by Richard Elliott Wainerdi and Lloyd E. Fite. 1964, 16p
Contract AT (40-1)-2671

Descriptors: (*Petroleum, Radioactivation analysis), (*Radioactivation analysis, Petroleum).

TID-21090 **Field 7E**
CFSTI Prices: HC$1.00 MF$0.50
Louisville Univ., Ky. Dept. of Chemistry.
RADIOLYSIS OF 1,5,9-CYCLODODECATRIENE,
by Richard H. Wiley, N. T. Lipscomb, andW. H. Rivera. 1961, 7p
Contract AT (40-1)-2055

Descriptors: (*Cycloalkenes, Radiation chemistry), Cyclododecatrienes.

TID-21615 **Field 7B, 7D**
CFSTI Prices: HC$2.00 MF$0.50
Temple Univ., Philadelphia, Pa.
TECHNICAL PROGRESS REPORT ON FUSED SALT SYSTEMS.
Jan 65, 33p
Contract AT (30-1)-2780

Descriptors: (*Electrolytes, Melting).

Identifiers: Fused salts.

TID-21847 **Field 7B, 7C, 7D**
CFSTI Prices: HC$3.00 MF$0.75
Fordham Univ., New York. Dept. of Chemistry.
THE THERMODYNAMICS AND KINETICS OF COORDINATION COMPOUNDS. PROGRESS REPORT.
by Michael Cefola and Philip S. Gentile. 4 Feb 65, 68p
Contract AT (30-1)-906

Descriptors: (*Complex compounds, Thermodynamics), (*Chelate compounds, Dynamics).

TID-22074 **Field 7A**
CFSTI Prices: HC$2.00 MF$0.50
Purdue Univ., Lafayette, Ind.
THE EFFECT OF PARTICLE SHAPE ON THE SUSPENSION OF SOLIDS IN REACTION VESSELS,
by J. Henry Rushton and Robert N. Tanksley. 1961, 40p
Contract AT (11-1)-804

Descriptors: (*Colloids, Containers), (*Particle size, Colloids).

UCRL-11951 **Field 7A**
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
AXIAL DISPERSION IN LIQUID FLOW THROUGH PACKED BEDS,
by Steven Frank Miller and C. Judson King. 24 May 65, 44p
Contract W-7405-eng-48

Descriptors: (*Fluid flow, Fluidized bed processes), (*Fluidized bed processes, Particle size).

UCRL-12496 **Field 7B**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
CHEMICAL BONDING AND THE SULFUR K-X-RAY SPECTRUM,
by D. W. Wilbur and J. W. Gofman. 20 Jul 65, 19p CONF-650810-1
Contract W-7405-eng-48
Prepared for presentation at Annual Conference on Applications of X-Ray Analysis, Denver.

Descriptors: (*Sulfur compounds, Chemical bonds), (*X-ray spectrum, Sulfur compounds).

UCRL-14166-T **Field 7A**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
A PROPOSED STANDARD FOR THE TITRATION OF AQUEOUS SOLUTIONS OF BORON,
by L. P. Rigdon and D. M. Colman. 21 May 65, 7p CONF-650839-1
Contract W-7405-eng-48
Prepared for presentation at Analytical Chemistry Conference, Lewiston, N. Y.

Descriptors: (*Boron, Solutions), (*Chemical engineering, Standards).

UCRL-7967 **Field 7E**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
THE SPECTROPHOTOMETRIC DETERMINATION OF TRACE AMOUNTS OF TANTALUM,
by John H. Hill. 28 Aug 64, 9p
Contract W-7405-eng-48

Descriptors: (*Tracer studies, Tantalum), (*Spectroscopy, Tracer studies).

USNRDL-TR-847 **Field 7D**
CFSTI Prices: HC$1.00 MF$0.50
Naval Radiological Defense Lab., San Francisco, Calif.
ION-EXCHANGE PROCESSES BETWEEN IMMISCIBLE MOLTEN PHASES,
by R. C. Scheidt and R. C. Freiling. 18 Apr 65, 14p
Contract AT (49-2)-1167

Descriptors: (*Ion exchange, Salts), (*Phase studies, Ion exchange).

WAPD-T-1662 **Field 7D, 11F, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Bettis Atomic Power Lab., Pittsburgh, Pa.
SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS OF SOME NICKEL AND IRON BASE ALLOYS,
by H. D. Cook, T. Kessler and L. T. Beeles. Jun 64, 20p CONF-649-28
Contract AT-11-1-GEN-14
Presented at Annual Conference on Mass Spectrometry and Applied Topics, (12th), Montreal, June 1964.

Descriptors: (*Nickel alloys, Mass spectroscopy), (*Iron alloys, Mass spectroscopy), (*Mass spectroscopy, Reactor materials).

8. EARTH SCIENCES AND OCEANOGRAPHY

AD-412 422 **Field 8K**
CFSTI Prices: HC$4.00
General Geophysical Co., Houston, Tex.
STUDY OF SEISMIC SIGNALS AND NOISE DETECTED BY A BURIED ARRAY.
Final rept., 15 Jan 62-15 Mar 63,
by G. C. Phillips, Changsheng Wu, and J. C. Woodall. 15 Apr 63, 117p GGCo-2236
Contract AF19 (628)-341, ARPA Order-180-61, Projs. AF-8652, VELA-UNIFORM, Task 865202
AFCRL 63-479

Descriptors: (*Seismometers, Underground structures), (*Seismology, Instrumentation), Seismological stations, Seismographs, Underground, Sensitivity, Signal-to-noise ratio, Seismic waves.

Identifiers: Vela-Uniform.

Simultaneous recordings of seismic signals and noises with instruments consisting of a short period verticalmovement Benioff seismograph and an array of seven shallowly buried low frequency seismometers have been compared. In general, the same earthquake signals were recorded in both systems, but the amplitudes of undesired background noise have been reduced in the buried-array system. It is concluded that the buriedarray system produces a cleaner, more outstanding, P-wave arrival event.

CU-2663-15 **Field 8C**
CFSTI Prices: HC$2.00 MF$0.50
Lamont Geological Observatory, Palisades, N.Y.
DIRECT CURRENT MEASUREMENTS, EQUATORIAL ATLANTIC R/V GERONIMO CRUISE 4.
Technical rept.,
by Robert Gerard. Dec 64, 36p CU-15-64
Contract AT (30-1)-2663

Descriptors: (*Ocean currents, Measurement), (*Atlantic ocean, Ocean currents).

PB-168 628 **Field 8L**
CFSTI Prices: HC$2.00 MF$0.50
Ohio State Univ. Research Foundation, Columbus, Ohio. Inst. of Polar Studies.
GLACIOLOGICAL STUDIES ON THE SOUTH POLE TRAVERSE, 1962-1963,
by Lawrence D. Taylor. Aug 65, 30p Rept. no. 17
Grant NSF-G23005,
Proj. OSURF-1445

Descriptors: (*Glaciers, Antarctic regions), (*Ice islands, Antarctic regions), Snow, Ice, Physical properties, Climatology.

PB-168 711 **Field 8F**
CFSTI Prices: HC$3.00 MF$0.75
Army Transportation Environmental Operations Group, Fort Eustis, Va.
OPERATION LEAD DOG, 1958.
Final rept.
1958, 56p
AD 218 166

Descriptors: (*Greenland, Exploration), Army research, Arctic regions, Meteorology, Terrain, Transportation, Logistics, Navigation, Communication systems.

Identifiers: Lead dog operation.

The report describes a series of exploratory missions designed to make a complete surface reconnaissance on the ice cap and into the ice-free coastal areas of Northern Greenland.

PB-168 745 **Field 8E, 17G, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Baker (Michael, Jr.), Inc., Rochester, Pa.
BEARING FROM POLARIS (DEVELOPED FOR IBM-650 M.D.D.P.M.).
Electronic computer program,
by J. H. Widmer. 1960, 34p
BPR Program SU-3

Descriptors: (*Astronomical geodesics, Programming (Computers)), (*Celestial navigation, Programming (Computers)), (*Programming (Computers), Celestial navigation), Direction finding, Position finding, Celestial mechanics, Stars, Data processing systems, Flow charting.

The program was developed to compute the true bearing of a line using observations of Polaris

taken at any time. Three direct and three reverse observations are used for input although provision is also made for using the mean angle and mean time as an alternative procedure. Ephemeris tables for Greenwich Hour Angle of Polaris, Latitude Correction and Polar Distance of Polaris are stored in the memory. (Author)

PB-168 905 **Field 8L**
CFSTI Prices: HC$2.00 MF$0.50
Ohio State Univ., Columbus. Dept. of Geodetic Science.
MAPPING GLACIERS IN WESTERN UNITED STATES: BURROUGHS GLACIER, DINWOODY GLACIER, PALISADE GLACIER.
Final rept. 21 Dec 60-31 Dec 61,
by Arthur J. Brandenberger. Jan 62, 26p
Grant NSF-G15997,
Proj. RF-1227

Descriptors: (*Glaciers, United States), Ice, Terrain, Alaska, Wyoming, California, Mapping, Photogrammetry.

The subject of this research is the preparation of photogrammetric maps of the Burroughs Glacier in Alaska, the Dinwoody Glacier in Wyoming and the Palisade Glacier in California. These maps were compiled in the scale 1:5000 with a contour interval of five meters, according to specifications established for the IGY Project 4.11. (Author)

PB-168 952 **Field 8K**
CFSTI Prices: HC$1.00 MF$0.50
Lamont Geological Observatory, Palisades, N.Y.
STANDARDIZATION AND CALIBRATION OF LONGPERIOD AND 'LG' SEISMOGRAPH NETWORK.
Final rept.,
by H. J. Miller. 25 Jun 63, 11p
Grant NSF-G8865

Descriptors: (*Seismographs, Calibration), Seismology, Seismological stations, Standardization.

The purpose of this project was to calibrate and standardize the network of long-period and 'Lg' seismographs that was established during the I. G. Y. In order to accomplish this a new method of calibrating electromagnetic seismographs was devised. The actual calibration of the seismographs consisted in: (1) using a steady state method to calibrate the seismographs as they had currently been operating; (2) making the necessary instrumental constant changes in order to standardize the seismographs; (3) repeating the steadystate calibration for the standardized operating conditions; and (4) installing a permanent pulse calibration system to provide a daily calibration signal. In the hope of maintaining the calibration and standardization, the calibration system was explained in detail to the personnel in charge of the seismographs at the various observatories. (Author)

PB-168 953 **Field 8G**
CFSTI Prices: HC$4.00 MF$0.75
Massachusetts Inst. of Tech., Cambridge. Dept. of Geology and Geophysics.
EXPERIMENTAL STUDY OF THE INDENTATION OF ROCKS AND MINERALS.
Final rept.,
by W. F. Brace. 1 Oct 61, 102p
Grant NSF-G4647

Descriptors: (*Petrology, Test methods), Minerals, Rock (Geology), Compressive properties, Crystallography, Hardness.

An evaluation test is made of the indentation hardness test as an experimental tool for the study of mechanical properties of geologic materials. It was found that the indentation hardness test has severe limitations but could nevertheless provide much useful information. The usefulness and limitations of this test in experimental geology together with several of the applications form the body of this report, which is a comprehensive summary of the work to date.

PB-168 962 **Field 8D, 8G, 8J**
CFSTI Prices: HC$6.00 MF$1.25
Marine Lab., Univ. of Miami, Coral Gables, Fla.
THE GEOCHEMISTRY OF RADIOACTIVE ELEMENTS IN THE MARINE ENVIRONMENT.
Progress rept.
Nov 62, 209p ML-62426
Grants NSF-G21966, NSF-G15744

Descriptors: (*Geologic age determination, Marine geology), (*Geochemistry, Natural radioactivity), (*Radiochemistry, Marine geology), (*Marine geology, Geologic age determination), Radioactive isotopes, Sedimentation, Well logging.

The objectives of the research are as follows: (1) Establishment and interpretation of Pleistocene and recent sedimentation rates through absolute dating; (2) Application, evaluation, and further development of the Pa (231)/Th (230) method; (3) Investigation of possible sources of error influencing precision and accuracy, refinement of analytical and counting methods; and (4) Evaluation of the possibilities of dating on the basis of ingrowth of radioactive daughter elements in marine and terrigenous uranium-bearing carbonates.

PB-168 968 **Field 8N, 4A**
CFSTI Prices: HC$4.00 MF$1.00
California Univ., Berkeley. Inst. of Engineering Research.
EFFECT OF GEOLOGIC CONDUCTORS UPON AUDIO FREQUENCY MAGNETIC FIELDS.
Master's thesis,
by Thomas Ross Jewell. Aug 62, 131p Series-192-Issue-1
Grants NSF-G14672, NSF-G22048

Descriptors: (*Atmospherics, Magnetic fields), (*Audiofrequency, Magnetic fields), (*Telluric currents, Atmospherics), (*Terrestrial magnetism, Atmospherics), Thunderstorms, Electromagnetic waves, Diurnal variations, Earth (Planet), Electrical conductance, Structural geology.

Audio-frequency magnetic fields originate mainly from a world wide distribution of energy sources associated with thunderstorms. This energy is propagated over great circle routes within an earth-ionosphere waveguide, and in passage is attenuated to varying degrees dependent upon the reflective properties of the waveguide. Various investigators have shown that the intensity and direction of the observed electromagnetic waves exhibit characteristic diurnal variations as a function of frequency, time of year, and geographical location. The results of this study demonstrate that the diurnal variations, particularly with regard to direction, are affected by the presence of a large, linear conductivity inhomogeneity in the vicinity of the recording site. Preliminary investigations were carried out near a mineralized fault zone roughly approximating a planar surface of unknown conductivity.

PB-168 969 **Field 8E, 8B**
CFSTI Prices: HC$6.00 MF$1.25
Ohio State Univ. Research Foundation, Columbus. Inst. of Geodesy, Photogrammetry and Cartography.
GEODESY IN THE SPACE AGE; SYMPOSIUM, FEBRUARY 6 - 8, 1961,
by Simo H. Laurila and W. A. Heiskanen. 1961, 229p Pub-15
Sponsored by NSF.

Descriptors: (*Geodesics, Symposia), Photogrammetry, Surveying, Astronomical geodesics, Mapping, Navigation, Electronic equipment, Geophysics, Education.

Contents: Electronic surveying, photogrammetry, physical geodesy, celestial methods, education.

PB-168 970 **Field 8J**
CFSTI Prices: HC$5.00 MF$1.00
Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
THE SALINITY REGIME AND EXCHANGE CHARACTERISTICS OF A SHALLOW COASTAL BAY SYSTEM.
Final rept.,
by Toshitsugu Sakou. Aug 63, 170p Ref-63-21T
Grant NSF-G19780,
Proj. A and M-299
Doctoral thesis.

Descriptors: (*Estuaries, Salinity), (*Salinity, Estuaries), Tidewater, Gulfs, Bays, Rivers, Transport properties, Mathematical prediction, Oceanology.

Data from prototype and hydraulic model observations for the Lake Pontchartrain-Lake Borgne system have been used for the analysis. The salinity prediction model is formulated on the basis of the equations of continuity and of salt conservation. The derivation of prediction equations based on this model was made by the method of regression analysis and the derived predictor coefficients were examined in terms of the effective exchange efficiency through the passes. The prediction equations for the model were tested by reconstructing the salinity regime for two separate years as an initial value problem using only the inflow data and the control salinity of the outer bay as input. The stability and inherent errors of the forecasting relations is discussed. Spectral analysis applied to 12 years of prototype data (salinity and inflow) demonstrates the effectiveness of correlation functions, power spectra and cross-spectra of the variables involved in the description and interpretation of the salinity regime with respect to the frequency response characteristics of the bay system. The cross-spectra are examined in relation to the possibility of applying optimum linear prediction. It was found that better optimum prediction could be made by transforming the input and/or output variables. It is demonstrated that the prediction of the major features of the salinity regime can be made and the merits of the various approaches are discussed. (Author)

PB-168 972 **Field 8D, 7E, 8J**
CFSTI Prices: HC$1.00 MF$0.50
Miami Univ., Coral Gables, Fla. Inst. of Marine Science.
GEOCHEMISTRY OF RADIOACTIVE ELEMENTS IN THE MARINE ENVIRONMENT.
Final rept.,
by F. F. Koczy and F. G. Walton Smith. Dec 64, 20p 64-6, ML-65009
Grant NSF-G21966

Descriptors: (*Geochemistry, Radioactive isotopes), (*Radiochemistry, Oceanology), (*Oceanology, Radiochemistry), Marine geology, Geologic age determination, Tracer studies, Radium.

PB-168 976 **Field 8A**
CFSTI Prices: HC$3.00 MF$0.50
Woods Hole Oceanographic Institution, Mass.
THE DISTRIBUTION OF CHLOROPHYLL IN THE WESTERN INDIAN OCEAN DURING THE SOUTHWEST MONSOON PERIOD, JULY 30-NOVEMBER 12, 1963,
by John Laird, B. B. Breivogel, and C. S. Yentsch. Jul 64, 55p Ref-64-33
Grant NSF-GP-821

Descriptors: (*Chlorophylls, Indian Ocean), (*Indian Ocean, Chlorophylls), Distribution, Oceanographic data, Tables.

Identifiers: Atlantis II.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

AD-281 722 **Field 9E**
CFSTI Prices: HC$4.00
Delta-f, Inc., Geneva, Ill.
DEVELOPMENT OF A QUARTZ CRYSTAL OSCILLATOR FOR COMMUNICATIONS SATELLITES.

Rept. no. 4 (Final), 15 Oct 60-15 Oct 61,
by H. E. Gruen and D. W. Scarborough, Jr. 15 Oct 61, 131p
Contract DA-36-039-sc-87366, ARPA Order-54-60,
Proj. DA-76-01-001-08,
Task 3G-26-05-001-03

Descriptors: (*Crystal oscillators, Communication satellites (Active)), Quartz, Circuits, Temperature, Very high frequency, Environmental tests, Space environmental conditions, Packaging.

An investigation of crystals, oscillator circuits and temperature control systems suitable for use in communications satellites is reported. Included are long term aging data of high frequency crystal oscillators using crystal units of various overtones, measured parameters, and oscillator characteristics. Individual oscillator types are discussed and reasons for the selection of the transistorized equivalent of the grounded grid circuit are given. Circuits investigated and reported on include buffer-amplifiers, buffer-doublers, parametric doublers, and proportional temperature controllers. Results of a preliminary investigation of redundant circuits is presented. This phase was initiated late in the program and several approaches have been investigated, but a practical design has not been realized. Package construction of several types of oscillators is discussed along with data on two types of insulation that were used in the package construction. (Author)

AD-420 398 **Field 9A**
CFSTI Prices: HC$2.00
Field Emission Corp., McMinnville, Oreg.
APPLIED RESEARCH ON FIELD EMISSION CATHODES.
Quarterly rept. no. 1, 15 Jun-15 Sep 63,
by E. E. Martin and F. M. Charbonnier. 15 Sep 63, 31p Rept. no. 5
Contract DA-36-039-AMC-03266 (E), ARPA Order-123-63,
Proj. DEFENDER,
Task DA-7776-11-013-38
Continuation of Contract DA-36-039-sc-90829.

Descriptors: (*Cathodes (Electron tubes), Field emission), (*Field emission, Cathodes (Electron tubes)), (*Tungsten alloys, Cathodes (Electron tubes)), Test facilities, Electron optics, Electron lenses, Zirconium alloys, Metal coatings, Maganesium, Absorption (Physical), Chemical reactions, Gases, Electrodes, Vacuum, Pulse generators, Electron beams, Electrostatic fields, Chemical milling, Life expectancy.

Research concerns a study of field emission cathodes and their eventual development to a practical electron source. The study of large emitters with the individual capability for emission of current in the several ampere range is currently being stressed. Progress toward establishment of an adequate testing facility and development of the necessary technology for efficient study of such cathodes is reviewed, and preliminary experimental results are reported. Development of an electron optical system for use with large emitters and the construction of a specific electron lens are discussed. Study of reduction of the divergence of emission from a tungsten cathode by means of a preferentially absorbed zirconium coating was continued and earlier quantitative results were repeated. Potential usefulness of W-Zr alloy emitters is being re-examined in the light of recent information concerning the role of oxygen in the absorption of Zr on W, and behavior of a magnesium coating on tungsten was studied with an aim toward better basic understanding of preferential absorption processes. (Author)

AD-432 223 **Field 9C, 13H**
CFSTI Prices: HC$2.00
Field Emission Corp., McMinnville, Oreg.
APPLIED RESEARCH ON FIELD EMISSION CATHODES.
Quarterly rept. no. 2, 15 Sep-15 Dec 63,
by E. E. Martin and F. M. Charbonnier. 15 Dec 63, 38p Rept. no. 6
Contract DA-36-039-AMC-03266 (E), ARPA Order-123-63,
Proj. DEFENDER,
Task DA-7776-11-013-38
Continuation of Contract DA-36-039-sc-90829.
See also AD-420 398.

Descriptors: (*Cathodes (Electron tubes), Field emission), (*Field emission, Cathodes (Electron tubes)), (*Tungsten alloys, Cathodes (Electron tubes)), Electrostatic fields, Zirconium, Voltage, Electric currents, Performance (Engineering), Electron tube parts, Electron optics, Manufacturing methods, Magnetic fields, Stability, Noise (Radio), Life expectancy.

A test facility which supplies 100 nanosecond, 300 kv pulses is in routine service, and was used in testing the characteristics of field emission cathodes with large terminal radii during both single and repetitively pulsed operation. The maximum emission current capability of cathodes of this type was found in good agreement with prediction; however, the voltage requirement has exceeded expectations. This is believed due to excessive shielding of the tip by the needle support filament; cathodes redesigned to lessen this effect are being readied for test. Edge shaped cathodes are being studied as an alternative to needles for high voltage use and appear to offer a number of advantages. An electrostatic lens assembly for use with field emitters at very high voltages was redesigned to eliminate current leakage experienced in the first lens of this type. The possibility of electrostatic reduction of radial and angular momenta components of a magnetically confined field emitted beam is being studied. The confinement of emission to the axial (100) region of a tungsten field emitter by selective deposition of zirconium was further studied. Means for control of the angular extent of the coverage were examined as were various means for increasing emission contrast; for a beam contained within a 40 degrees solid angle from the emitter tip, approximately a three fold increase in perveance was achieved. (Author)

AD-461 629 **Field 9A, 20N**
CFSTI Price: HC$1.00
Ohio State Univ. Research Foundation, Columbus. Antenna Lab.
THE PROPERTIES OF A RECTANGULAR WAVEGUIDE WITH A DISSIPATIVE SLAB AT THE CENTER,
by J. H. Richmond. 10 Feb 65, 19p OSURF-1804-2
Contract NOw-64-0293-d
Rept. on Electronic Polarization Control.

Descriptors: (*Waveguides, Dielectric properties), Attenuation, Atlenuators, Phase shifters, Permeability (Magnetic), Electric fields, Magnetic fields, Polarization.

An exact solution is developed for the fields in a rectangular waveguide with a dielectric slab at the center. The surfaces of the slab are assumed to be parallel with the sidewalls of the waveguide, and the field is that of a TE mode with the electric vector parallel with the slab surfaces. The thickness of the slab is arbitrary, but the height of the slab is taken equal to that of the waveguide with the remaining space assumed to be free space. Although the equations are transcendental, it is possible to solve them to determine the guide wavelength and the guide attenuation constant if the slab parameters (dielectric constant, permeability, electric loss tangent and magnetic loss tangent and thickness) are known. Thus, the expressions are useful in the design of waveguide attenuators and phase shifters. The equations can be solved more readily for the parameters of the slab after the guide wavelength and attenuation constant have been measured, this forming the basis of a promising technique for measuring dielectric constants, permeabilities, and loss tangents. (Author)

AD-465 228 **Field 9B, 5A**
CFSTI Prices: HC$4.00 MF$1.00
Systems Development Corp., Santa Monica, Calif.
PLANNING GUIDE FOR COMPUTER PROGRAM DEVELOPMENT.
Technical memo.,
by Leonard Farr, Victor LaBolle and Norman E. Willmorth. 10 May 65, 161p TM-2314/000/00
Contract Nonr-4543 (00)

Descriptors: (*Programming (Computers), Systems engineering), (*Management planning, Programming (Computers)), Scheduling, Costs, Coding, Data processing systems, Design, Analysis.

The document offers a systematic approach for planning projects to develop computer-based information systems. The primary emphasis is placed on the computer program portion of such systems. A descriptive model of the development process forms the basis for a set of prescribed planning and management tasks. The model includes eight phases: (1) System Analysis, (2) System Design, (3) Program Development, (4) Program Coding, (5) Program Checkout, (6) User Documentation, (7) User Training and Assistance, and (8) Turnover. Each phase is further divided into tasks and subtasks for the purpose of more clearly understanding the elements of the development process. A detailed sequence of planning activities provides guidance for planning, scheduling and costing the tasks that comprise the development process, and forms are supplied to record the planning results and to serve as checklists for the required work. The forms and procedures also provide a basis for project control and for collection of data that may be used to improve estimates based upon experience. (Author)

BDX-613-19 **Field 9B**
CFSTI Prices: HC$3.00 MF$0.75
Kansas. Univ., Lawrence.
AN ANALOG COMPUTER FOR DEVELOPMENT PROJECT SCHEDULING.
Master's thesis,
by David H. Hax. May 61, 66p
Contract AT (29-1)-613
Submitted to University of Kansas.

Descriptors: (*Scheduling, Analog computers), (*Analog computers, Scheduling).

BDX-613-3 **Field 9A**
CFSTI Prices: HC$4.00 MF$1.00
Kansas. Univ., Lawrence.
FUNDAMENTALS OF HYDROGEN THYRATRONS.
Master's thesis,
by S. J. Cataland. Jun 60, 143p
Contract AT (29-1)-913
Submitted to the University of Kansas.

Descriptors: (*Thyratrons, Hydrogen).

BDX-613-30 **Field 9A**
CFSTI Prices: HC$3.00 MF$0.75
Kansas. Univ., Lawrence.
PERMEATION OF HELIUM INTO VACUUM TUBES.
Master's thesis,
by John J. Rode. May 62, 76p
Contract AT (29-1)-613
Submitted to University of Kansas.

Descriptors: (*Electron tubes, Permeability), (*Diffusion, Helium).

BDX-613-72 **Field 9E**
CFSTI Prices: HC$4.00 MF$0.75
Bendix Corp., Kansas City, Mo.
A SENSITIVE, HIGH-SPEED, DC VOLTAGE COMPARATOR.
Master's thesis,
by Robert G. Piper. Jun 65, 108p
Contract AT (29-1)-613

Descriptors: (*Comparators, Transistors), (*Voltage, Comparators).

COO-614-31 **Field 9B**
CFSTI Prices: HC$3.00 MF$0.75
Chicago Univ., Ill. Inst. for Computer Research.
ICR QUARTERLY REPORT.
Rept. for 1 Feb 65,
by Nicholas Metropolis. 1965, 89p Rept. no. 4
Contract AT (11-1)-614

Descriptors: (*Programming (Computers), Algorithms), (*Computers, Scientific research).

GAMD-4447 **Field 9B, 18I**
CFSTI Prices: HC$4.00 MF$1.00
General Atomic, John J. Hopkins Lab. for Pure and Applied Science.
ESTA. EBOR SYSTEM TRANSIENT ANALYSIS, CODE DESCRIPTION AND RESULTS,
by J. B. Dunlay and J. E. Gratteau. 30 Jul 63, 139p
Contract AT (04-3)-187,
Proj. 40.4467

Descriptors: (*Programming (Computers), Reactor operation).

GAMD-5239 **Field 9B, 20K**
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
PIZZA -- AN IBM COMPUTER CODE FOR THE PLANE STRESS ANALYSIS OF TWO-DIMENSIONAL BODIES. INPUT INSTRUCTIONS,
by D. C. Cornell. 1 Nov 64, 63p
Contract AT (04-3)-167

Descriptors: (*Programming (Computers), Mechanics), Stresses.

Identifiers: Pizza.

HW-80968 **Field 9B, 18K**
CFSTI Prices: HC$3.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
USERS MANUAL FOR HFN AND CALX CHAIN,
by E. L. Kelley, Jr. 16 Mar 64, 91p
Contract AT (45-1)-1350

Descriptors: (*Programming (Computers), Instruction manuals), (*Reactor kinetics, Programming (Computers)).

KAPL-M-6456 **Field 9B, 12A**
CFSTI Prices: HC$2.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
DOGGY -- A PROGRAM TO PERFORM MATHEMATICAL FORM SHEET CALCULATIONS.
by Sally A. Gazda. 5 Mar 65, 33p
Contract W-31-109-eng-52

Descriptors: (*Programming (Computers), Algebra), (*Special functions, Programming (Computers)).

N65-15051 **Field 9A**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
FLOW OF ELECTRONS THROUGH A NEUTRAL SCATTERING GAS IN A THERMIONIC DIODE,
by P. M. Sockol. 1964, 9p NASA-TM-X-52069
Presented at Thermionic Conversion Specialist Conf. of the IEEE, Cleveland, 26-28 Oct. 1964.

Descriptors: (*Diodes (Electron tubes), Electrons), (*Electrons, Motion).

N65-15140 **Field 9A**
CFSTI Prices: HC$2.00 MF$0.50
CBS Labs., Stamford, Conn. Electron Tube Div.
1-112 INCH RUGGED IMAGE DISSECTOR TUBE.
Final rept. 25 Feb-18 Sep 64,
by S. Juchnowycz. 12 Oct 64, 39p
Contract JPL-950848
NASA CR-60195

Descriptors: (*Image tubes, Reliability (Electronics)).

N65-18190 **Field 9B**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
AVOIDING BLACK BOX COMPUTER PROGRAMS,
by A. Hisler. Oct 64, 22p NASA-TM-X-55149, X-671-64-334

Descriptors: (*Programming (Computers), Scientific research).

N65-18193 **Field 9E**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
DESIGN TECHNIQUES FOR VARACTOR FREQUENCY MULTIPLIERS,
by R. V. Snyder. Dec 64, 39p NASA-TM-X-55162, X-632-64-378

Descriptors: (*Frequency multipliers, Design).

N65-18267 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Goddard Space Flight Center, Greenbelt, Md.
A VERY STABLE AND LINEAR 10-GAIN DIRECT CURRENT AMPLIFIER,
by H. L. Richard. Nov 64, 12p NASA-TM-X-55150, X-524-64-336

Descriptors: (*Amplifiers, Direct current).

N65-19503 **Field 9A**
CFSTI Prices: HC$3.00 MF$0.75
General Electric Co., Schenectady, N. Y., Power Tube Dept.
DEVELOPMENT OF HIGH TEMPERATURE CERAMIC RECTIFIERS, THYRATRONS, AND VOLTAGE REGULATOR TUBES.
Final rept., 28 Jun 63-7 Oct 64,
by E. A. Baum. 25 Oct 63, 76p
Contract NAS3-2548
NASA CR-54303

Descriptors: (*Rectifiers, Production), (*Thyratrons, Production), (*Voltage regulators, Production).

NYO-1480-19 **Field 9B, 6D**
CFSTI Prices: HC$3.00 MF$0.75
Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
PATTERN RECOGNITION,
by R. Bianchini and M. Shostak. 15 Dec 64, 92p
Contract AT (30-1)-1480

Descriptors: (*Pattern recognition, Computers), (*Bionics, Pattern recognition).

ORNL-TM-1151 **Field 9B, 20H**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
DWB DEUTERON STRIPPING PROGRAM,
by William R. Smith. 10 Jun 65, 26p
Contract W-7405-eng-26

Descriptors: (*Programming (Computers), Deuteron reactions), (*Deuteron reactions, Programming (Computers)).

ORNL-TM-1192 **Field 9B, 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
SOURCE, A NEUTRON DISTRIBUTION ROUTINE FOR THE 05R MONTE CARLO CODE,
by J. T. Mihalezo, G. W. Morrison and D. Irving. 8 Jul 65, 14p
Contract W-7405-eng-26

Descriptors: (*Neutron transport theory, Programming (Computers)), (*Programming (Computers), Monte Carlo method).

Patent 3,217,288 **Field 9A**
NOISE MEASUREMENT HYDROPHONE.
Patent assigned to Navy,
by Claude C. Sims. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Hydrophones, Noise), (*Noise, Measurement), Patents, Transducers, Sea water, Oceanographic vessels, Design.

The hydrophone is for measuring the noise radiated into seawater by various types of self-powered vessels. The structure includes a base assembly, two wicketlike frame members, glass seals in the base assembly for a pair of crystal leads, and a crystal assembly. The entire unit is covered with a boot of plastic materials.

PB-168 945 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
MICROWAVE POWER METERS HEWLETT-PACKARD 430C AND 430B-95B (MODIFIED) SPERRY MICROLINE 31A1 TS-779/U (P/O AN/URM-98).
Technical manual instrument calibration procedure GP-02.
15 Oct 65, 15p NAVWEPS-17-20GP-02
Supersedes NAVWEPS-17-20GP-02, dated 15 Jul 63, PB-181 660.

Descriptors: (*Power meters, Microwave equipment), (*Measuring devices (Electrical + Electronic), Calibration), Instruction manuals, Test methods.

The manual describes the calibration procedure for the Hewlett-Packard 430C, the Hewlett-Packard 430B95B (modified), the Sperry Microline 31A1, or the TS779/U (P/O AN/URM-98) power meter.

PB-168 946 **Field 9C**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
OSCILLOSCOPES 535, 545, 945 RM-35, RM-45, AN/USM-120 (TEKTRONIX).
Technical manual instrument calibration procedure AW-08.
15 Jul 65, 35p NAVWEPS-17-20AW-08
Supersedes NAVWEPS17-20AW-08, dated 15 Jan 63, PB-181 439.

Descriptors: (*Oscillocopes, Calibration), Test equipment (Electronics), Instruction manuals, Test methods.

The manual describes the calibration procedure for the Tektronix 535, 545, 945, RM-35, RM-45, or AN/USM120 oscilloscope which is a broadband laboratory oscilloscope with calibrated main sweeps, calibrated delaying sweeps, sweep magnification, a square-wave calibrator, provisions for automatic or adjustable triggering from either internal or external sources, and the necessary power supplies.

PB-169 010 **Field 9A**
CFSTI Prices: HC$5.00 MF$1.00
SEMICONDUCTOR RESEARCH, DEVELOPMENT, AND TECHNOLOGY IN COMMUNIST CHINA.
Feb 66, 170p PAL-66-1

Descriptors: (*Semiconductor devices, China), Solid state physics, Transistors, Diodes (Semiconductor), Tunnel diodes, Germanium, Silicon, Intermetallic compounds, Production, Semiconductors.

An ability to develop and produce transistors and other semiconductor devices is part of the electronics capability of a country and can be used in part to measure its progress in domestic and military affairs. This is a particularly useful measure in a country such as Communist China where technological progress has been slow until recent years. Major attention is given in this paper to active components like transistors, diodes, and tunnel diodes which are based on germanium, silicon, and certain intermetallic compounds (e.g., gallumarsenide and bismuth-telluride), which exhibit semiconductor properties. Marginal topics such as copperoxide rectifiers, selenium rectifiers, crystal microphones, and thermoelectric generators have not been investigated. Almost all of the translated material on transistors and semiconductor devices that is used in this report came from a large assortment of nontechnical articles and isolated statements from Chinese Communist books, newspapers, magazines, and radio broadcasts. The cutoff date for the study is 1 March 1965.

PB-169 012 **Field 9C**
CFSTI Prices: HC$3.00 MF$0.75
Bureau of Naval Weapons, Washington, D. C.
RADAR TEST SET AN/UPM-98, AN/UPM-99, AN/UPM-111.
Technical manual instrument calibration procedure GQ-04.
15 Aug 65, 91p NAVWEPS-17-20GQ-04
Distribution: No limitation.

Descriptors: (*Radar equipment, Test sets), (*Test sets, Calibration), Portable, Identification systems, Instruction manuals, Test methods.

The manual describes the calibration procedure for the AN/UPM-98, AN/UPM-99, or the AN/UPM-111 radar test sets. These instruments are portable, ac-powered test sets for the maintenance of Mark X and SIF type IFF equipments.

PB-169 014 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Boeing Co., Seattle, Wash. Aero-Space Div.
STANDARD-SIGNAL GENERATOR 805-C, -D (GENERAL RADIO COMPANY).
Technical manual instrument calibration procedure AG-79.
15 Oct 65, 24p
Contract N123 (62861)35056A
NAVWEPS 17-20AG-79

Descriptors: (*Signal generators, Calibration), Standards, Test equipment (Electronic), Instruction manuals, Test methods.

The manual describes the calibration procedure for the General Radio 805-C and 805-D Standard Signal Generators, with the Type 805-P1 Termination Unit. The Test Instrument covers the frequency range of 16 kHz to 50 MHz in sever ranges with an output voltage range of 0.1 microvolt to 2 volts.

PB-169 015 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
PREAMPLIFIER TYPE H (TEKTRONIX).
Technical manual instrument calibration procedure AA-27.
15 Oct 65, 14p NAVWEPS-17-20AA-27

Descriptors: (*Preamplifiers, Calibration), (*Oscilloscopes, Preamplifiers), Test equipment (Electronics), Instruction manuals, Test methods.

The manual describes the calibration procedure for the Tektronix type H preamplifier. The Test Instrument is a plug-in, wide-band, high-gain amplifier used with Tektronix oscilloscopes. It provides calibrated step attenuation, a vertical positioning control, and either d-c or a-c coupling for either of two signal input channels.

PB-169 017 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Boeing Co., Seattle, Wash. Aero-Space Div.
SQUARE WAVE GENERATOR TS-583/U, TS-583A/U, TS-583B/U 210A (HEWLETT-PACKARD) E-136204 (LAVOIE).
Technical manual instrument calibration procedure, AG-75.
15 Oct 65, 18p
Contract N123 (62861)35056A
NAVWEPS 17-20AG-75

Descriptors: (*Waveform generators, Calibration), Instruction manuals, Test methods.

The manual procedure describes the calibration procedure for the TS-583/U, A/U, B/U, HP 210A and Lavoie E-136204 square wave generators, which converts a sinewave input to a square wave output.

PB-169 019 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Milmanco Corp., Renton, Wash.
PULSE GENERATOR MODEL 79-B (MEASUREMENTS CORPORATION).
Technical manual instrument calibration procedure, AG-76.
1 Oct 65, 12p
Contract N123 (62861)51295A
NAVWEPS 17-20AG-76;
PB 167 753 superseded
NAVWEPS-17-20AG-76 dated 15 Feb 65 superseded.

Descriptors: (*Pulse generators, Calibration), Electronic equipment, Instruction manuals, Test methods.

The manual describes the calibration procedure for the Measurements Corporation Model 79-B pulse generator. The Test Instrument is a pulse generator with the capability of generating pulses of variable width and frequency for use with associated equipment. A pulsemodulated carrier output may be obtained by connecting the self-contained modulator stage to an external radio frequency carrier source. The Test Instrument may also be synchronized to an external frequency standard.

PB-169 027 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Boeing Co., Seattle, Wash. Aero-Space Div.
PEAK POWER CALIBRATOR 8900A (BOONTON RADIO CO.).
Technical manual instrument calibration procedure, AP-07.
15 Sep 65, 13p
Contract N123 (62861)35056A
NAVWEPS 17-20AP-07

Descriptors: (*Radiofrequency pulses, Power meters), (*Power meters, Calibration), Power frequency power, Measurement, Instruction manuals, Test methods, Test equipment (Electronics).

The manual describes the calibration for the Boonton Radio Company 8900A Peak Power Calibrator. The Test Instrument will measure peak RF power of pulses, from 150 to 1500 Mc.

PB-169 041 **Field 9B**
CFSTI Prices: HC$2.00 MF$0.50
System Development Corp., Santa Monica, Calif.
STUDY OF SMALL-SCALE TABULAR DISPLAY SYSTEMS,
by Michael A. Painter. 2 Aug 65, 31p Technical memo. TM-2571

Descriptors: (*Display systems, Tables), (*Computers, Display systems), Input-output devices, Teletype systems, Programming (Computers), Performance (Engineering).

Identifiers: Computer consoles.

The paper explores the characteristics of the tabular display terminal being considered for use by SDC's Computer Center Department. The equipment built by IBM, General Electric, Control Data, Teleregister, Stromberg Carlson, Raytheon, and RCA is examined with reference to the prospective requirements of the Computer Center Department. Acceptability of these display terminals is predicated on their ability to perform a dual task: (1) operate as an input-output unit for subject experimentation; (2) provide interactive capabilities for on-line programming. A tabular display terminal allows an experimental subject or programmer to enter data through a keyboard that is quite similar to that of a typewriter, and to have the entered data presented on a display screen. The unique feature of this equipment is the ability of the terminal operator to compose and edit data in an off-line mode; when the input message is correct, the information is transmitted to the central processor. The various systems are compared on a performance and cost basis, and, in addition, the general concept of a tabular display terminal is compared to existing teletype systems. (Author)

PB-169 044 **Field 9B, 5K**
CFSTI Prices: HC$3.00 MF$0.75
System Development Corp., Santa Monica, Calif.
SPAN REFERENCE MANUAL. DATA FILES MANIPULATION AND PROCESSING,
by Vladimir V. Almendinger. 1 Dec 65, 89p
Technical memo. TM-1563/021/02
Contract CPR-11-1543
See also AD-613 289.

Descriptors: (*Data processing systems, Specifications), (*Urban areas, Statistical analysis), Management control systems, Data storage systems, Input-output devices, Programming (Computers), Social sciences, Computers.

Identifiers: SPAN (Statistical Processing and Analysis).

The volume describes the specification and application of SPAN capabilities for the processing of simple files and for report generation from simple files. Operations utilizing the following SPAN modules are discussed: BCD-to-STARS Conversion, STARS-to-BCD Conversion, STARS Files Abstractor, STARS Files Collator, and STARS Files Summary-Sort. (Author)

PB-169 045 **Field 9B**
CFSTI Prices: HC$3.00 MF$0.75
System Development Corp., Santa Monica, Calif.
THE MADAM SYSTEM,
by William O. Crossley. 2 Dec 65, 63p Technical memo. TM-2198/002/00
See also AD-620 661.

Descriptors: (*Data processing systems, Records), Programming (Computers), Computers, Programming languages, Control sequences, Reports, Punched cards, Magnetic tape, Data, Indexes.

Identifiers: MADAM computer program, File structures, Sorting (Computers).

MADAM (Moderately Advanced DAta Management) is a program which builds and manipulates files, and generates reports. This document describes Version IV of the system--its rationale, utilization, grammar and vocabulary.

PB-169 046 **Field 9B, 5K**
CFSTI Prices: HC$2.00 MF$0.50
System Development Corp., Santa Monica, Calif.
SPAN REFERENCE MANUAL, SPAN DATA-TRANSFORMATIONS AND STRATIFICATION CAPABILITY,
by Vladimir V. Almendinger. 1 Dec 65, 38p
Technical memo. TM-1563/014/02
Contract CPR-11-1543
See also AD-613 285.

Descriptors: (*Data processing systems, Information retrieval), (*Information retrieval, Correlation techniques), (*Correlation tech-

niques, Information retrieval), Programming (Computers), Transformations (Mathematics), Statistical analysis, Classification, Control sequences, Instruction manuals, Social sciences, Management planning, Urban areas, Compilers.

Identifiers: SPAN (Statistical Processing and Analysis).

The volume describes the specification and use of SPAN capabilities for the transformation of the contents of a data file in the course of its input to a SPAN process. The data-transformation capability allows the user to state algorithmic procedures leading to the generation of new data variables as transformations of the source data. The entity stratification capability provides for the classification and selection of entity records according to user-specified criteria. (Author)

PB-169 058 **Field 9C**
CFSTI Prices: HC$3.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
NAVY CALIBRATION EQUIPMENT LIST.
1 Nov 65, 55p NAVWEPS-17-35NCE-1
Supersedes NAVWEPS-17-35NCE-1 dated 1 Jun 64.

Descriptors: (*Test equipment (Electronics), Catalogs), Calibration, Naval equipment, Electronic equipment.

The document sets forth those instruments known to be available to Navy and Marine Corps Calibration Laboratories participating in the Navy Calibration Program.

PB-169 059 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
FREQUENCY-POWER METER AN/SPM-4.
Technical manual instrument calibration procedure, GQ-15.
15 Aug 65, 11p NAVWEPS-17-20GQ-15
Supersedes interim edition released 15 Sep 63.

Descriptors: (*Radar equipment, Frequency meters), (*Frequency meters, Calibration), (*Power meters, Calibration), Instruction manuals, Test methods.

The AN/SPM-4 frequency-power meter is designed to make frequency and power measurements of radar systems over a frequency range of 5.4 to 5.9 Gc, and a power range of +1 to +30 dbm. The required accessory calibration is described in section 6 of this procedure.

SC-R-65-935 **Field 9B, 18D**
CFSTI Prices: HC$1.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
COMPUTER AIDED CIRCUIT RELIABILITY ANALYSIS,
by B. O. Allen, D. R. Blazek and C. H. Purdue. Jul 65, 13p CONF-650115-1
Contract AT (29-1)-789
Presented at National Symposium on Reliability and Quality Control (11th), Miami Beach, Fla.

Descriptors: (*Computers, Reliability (Electronics)), (*Reliability (Electronics), Circuits).

SC-TM-64-1677 **Field 9A, 20L**
CFSTI Prices: HC$2.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
STRUCTURE AND ELECTRICAL PROPERTIES OF VACUUM-DEPOSITED CdS THIN FILMS,
by L. E. Terry and E. E. Komarek. Nov 64, 37p
Contract AT (29-1)-789

Descriptors: (*Thin films (Storage devices), Electrical properties), (*Crystal structure, Thin films (Storage devices)).

SC-TM-64-509 **Field 9C, 18D**
CFSTI Prices: HC$2.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
BASIC UNCERTAINTIES IN ELECTRICAL MEASUREMENTS,
by R. E. McCallum. Dec 64, 28p
Contract AT (29-1)-789

Descriptors: (*Measuring devices (Electrical + Electronic), Theory).

TID-21413 **Field 9B**
CFSTI Prices: HC$6.00 MF$1.25
Chicago Univ. Inst. for Computer Research.
ICR QUARTERLY REPORT.
Rept. for 1 Aug 64,
by Nicholas C. Metropolis. 1964, 231p Rept. no. 2
Contract AT (11-1)-614

Descriptors: (*Computers, Scientific research).

TID-21546 **Field 9B, 5B**
CFSTI Prices: HC$2.00 MF$0.50
Christian Michelsens Institutt for Videnskap Og Andsfrihet, Bergen (Norway).
AUTOMATIC PARAMETER SEARCH ON AN ANALOG COMPUTER,
by Karl M. Wiig. 25 Apr 64, 30p ANITA-14
Contract AT (30-1)-2607

Descriptors: (*Analog computers, Information retrieval), (*Search theory, Analog computers).

TID-21595 **Field 9B**
CFSTI Prices: HC$4.00 MF$1.00
Chicago Univ., Ill. Inst. for Computer Research.
ICR QUARTERLY REPORT NO. 1,
by Nicholas C. Metropolis. 1 May 64, 136p
Contract AT (11-1)-614

Descriptors: (*Computers, Scientific research).

TID-21920 **Field 9A**
CFSTI Prices: HC$3.00 MF$0.75
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
INPUT IMPEDANCE OF EMITTER FOLLOWERS.
Scientific rept. no. 15,
by B. F. Dewitt and J. F. Pierce. 1 Nov 64, 71p
Contract W-7405-eng-26

Descriptors: (*Cathode followers, Electrical impedance), (*Electrical impedance, Cathode followers).

TID-21922 **Field 9E, 20C**
CFSTI Prices: HC$2.00 MF$0.50
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
A D-C TO D-C CONVERTER UTILIZING A CERAMIC PIEZOELECTRIC TRANSFORMER.
Scientific rept. no. 8,
by S. J. Gourse. 10 Jun 63, 44p
Contract W-7405-eng-26

Descriptors: (*Transformers, Piezoelectric crystals), (*Piezoelectric crystals, Ceramic materials).

TID-21936 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
PROGRESS REPORT ON SUBCONTRACT NO. 2160 FOR THE PERIOD DECEMBER 15, 1961 TO DECEMBER 1, 1962.
J. F. Pierce. 17p
Contract W-7405-eng-26

Descriptors: (*Pulse amplifiers, Semiconductor devices), (*Current amplifiers, Semiconductor devices), Electronics.

TID-21971 **Field 9A, 11C**
CFSTI Prices: HC$4.00 MF$0.75
Temple Univ., Philadelphia, Pa.
ANODIZED ZIRCONIUM PHOTOVOLTAIC CELLS.
Doctoral thesis,
by Pallassana N. Ramachandran. 1 May 65, 104p
Contract AT (30-1)-2775
Submitted to Temple Univ., Philadelphia, Pa.

Descriptors: (*Phototubes, Electrodes), (*Zirconium, Anodic coatings).

TID-21972 **Field 9A, 20C**
CFSTI Prices: HC$4.00 MF$0.75
Temple Univ., Philadelphia, Pa.
STUDIES OF PHOTOEFFECTS OCCURRING WITH ANODIZED NIOBIUM ELECTRODES.
Doctoral thesis,
by Robert Aloysius Schell. Jun 64, 121p
Contract AT (30-1)-2775

Descriptors: (*Electrodes, Niobium), (*Photoelectric effect, Electrodes).

TID-22061 **Field 9C**
CFSTI Prices: HC$3.00 MF$0.50
Vanderbilt Univ., Nashville, Tenn.
EFFICIENCY OF HIGH PRESSURE ELECTRIC SHOCK TUBES.
Master's thesis,
by Terrill Wayne Mayes. Aug 65, 51p
Contract AT (40-1)-1087

Descriptors: (*Shock tubes, High-pressure research), (*High-pressure research, Shock tubes).

TIM-939 **Field 9B**
CFSTI Prices: HC$1.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
LAG - A LOAD AND GO ASSEMBLER WRITTEN FOR THE CDC-1604-B COMPUTER,
by R. Lawrence. 22 Jul 65, 18p
Contract AT (30-1)-2789

Descriptors: (*Programming (Computers), Digital computers).

TIM-940 **Field 9B**
CFSTI Prices: HC$1.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
CMPXMAT, A TRANSFER FUNCTION EVALUATION PROGRAM,
by P. G. Evick. 23 Jul 65, 12p
Contract AT (30-1)-2789

Descriptors: (*Programming (Computers), Functions), (*Functions, Programming (Computers)).

UCRL-11648 **Field 9B, 20H**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
A FORTRAN PROGRAM FOR CALCULATING KINEMATICAL AND DYNAMICAL QUANTITIES OF PARTICLE INTERACTIONS AND DECAYS,
by W. Peter Trower. 3 Sep 64, 3p
Contract W-7405-eng-48

Descriptors: (*Programming (Computers), Nuclear reactions), (*Nuclear reactions, Relativity theory).

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UCRL-12117-T Field 9E
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
MODULAR, PLUG-IN CHASSIS SYSTEM PERMITS COMPATIBLE MOUNTING OF CONVENTIONAL CHASSIS, PRINTED CIRCUIT BOARDS, AND MICROMODULES,
by C. Pass. 17 Aug 64, 19p
Contract W-7405-eng-48

Descriptors: (*Modules (Electronic), Compatibility), (*Test equipment (Electronics), Modules (Electronic)).

WAPD-TM-479 Field 9B, 18I
CFSTI Prices: HC$4.00 MF$1.00
Bettis Atomic Power Lab., Pittsburgh, Pa.
CHIC-KIN--A FORTRAN PROGRAM FOR INTERMEDIATE AND FAST TRANSIENTS IN A WATER MODERATED REACTOR,
by J. A. Redfield. Jan 65, 109p
Contract AT-11-1-GEN-14

Descriptors: (*Programming (Computers), Reactor kinetics).

10. ENERGY CONVERSION (NON-PROPULSIVE)

GA-5651 Field 10B, 20M
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
INTERNAL ENERGY LOSSES IN A CESIUM THERMIONIC CONVERTER,
by J. W. Holland. 25 Nov 64, 8p CONF-641011-1
Contract AT (04-3)-167
Presented at the Thermionic Conversion Specialist Conference, Cleveland, Ohio 26-28 Oct 64.

Descriptors: (*Thermionic converters, Cesium), (*Heat transfer, Thermionic converters).

LA-DC-6898 Field 10-
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
SPECTROGRAPHIC INVESTIGATION OF THE IGNITED MODE OF THERMIONIC CONVERTER OPERATION,
by Walter H. Reichelt. 1965, 11p CONF-650908-2
Contract W-7405-eng-36
Presented at International Conference on Thermionic Electrical Power Generation, London.

Descriptors: (*Thermionic converters, Electrical properties).

N65-17454 Field 10A
CFSTI Prices: HC$3.00 MF$0.50
Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
INORGANIC ION EXCHANGE MEMBRANE FUEL CELL.
Quarterly progress rept. for the period ending 10 Jan 65,
by C. Berger and M. P. Strier. Jan 65, 57p SM-46221-Q2
Contract NAS3-6000
NASA CR-54280

Descriptors: (*Fuel cells, Membranes).

N65-18260 Field 10A
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
SLOPE DETECTION AS A METHOD OF DETERMINING THE PEAK POWER POINT OF SOLAR ARRAYS,
by J. Paulkovich. Oct 64, 16p NASA-TM-X-55137, X-636-64-282

Descriptors: (*Solar cells, Power).

NAA-SR-MEMO-2987 Field 11B, 14B, 20M
CFSTI Prices: HC$1.00 MF$0.50
Atomics International, Canoga Park, Calif.
THE THERMAL EXPANSION OF AL203,
by Lawrence H. Rachal. 7 Aug 58, 8p
Contract AT (11-1)-GEN-8

Descriptors: (*Thermal expansion, Ceramic materials), (*Aluminum compounds, Oxides).

NAA-SR-MEMO-3830 Field 18K, 18G
CFSTI Prices: HC$1.00 MF$0.50
Atomics International, Canoga Park, Calif.
SODIUM-24 SPECIFIC ACTIVITY IN HNPF U-MO AND U-CREACTOR SYSTEMS,
by P. Spiegler. 21 May 59, 17p
Contract AT-11-1-GEN-8

Descriptors: (*Fission product activity, Sodium), (*Power reactors, Reactor kinetics).

11. MATERIALS

AD-466 674 Field 11F
CFSTI Prices: HC$1.00 MF$0.50
Naval Air Engineering Center, Philadelphia, Pa. Aeronautical Materials Lab.
INVESTIGATION INTO THE CHARACTERISTICS AND PROPERTIES OF WHISKERS, FIBERS, AND THIN FILMS. INVESTIGATION OF FIBROUS BREAK IN 7075-T6 ALUMINUM ALLOY EXTRUDED CHANNEL SECTION.
23 Jul 65, 4p Rept. no. NAEC-AML-2239
Task RRMA-03-004/200-1/R007-04-01

Descriptors: (*Aluminum alloys, Fracture (Mechanics)), Extrusion, Metallography, Grain structures (Metallurgy), Fiber metallurgy, Beams (Structural), Fractography, Microstructure, Laminates.

Identifiers: Aluminum alloy 7075.

COO-1319-24 Field 11F
CFSTI Prices: HC$2.00 MF$0.50
Ohio State Univ. Research Foundation, Columbus.
A STUDY OF THE MECHANISM OF STRESS CORROSION CRACKING IN THE IRON - NICKEL - CHROMIUM ALLOY SYSTEM.
Quarterly rept. 17 Dec 64-16 Mar 65,
by R. W. Stachle, F. H. Beck, and M. G. Fontana. 5 Apr 65, 29p
Contract AT (11-1)-1319

Descriptors: (*Stress corrosion, Iron alloys), Nickel alloys, Chromium alloys.

COO-770-11 Field 11F, 7A
CFSTI Prices: HC$1.00 MF$0.50
Missouri School of Mines and Metallurgy, Rolla. Dept. of Chemical Engineering and Chemistry.
SEPARATION OF CESIUM AND STRONTIUM BY ELECTRODIALYSIS,
by H. C. Hershey, R. D. Mitchell, and W. H. Webb. 1962, 10p
Contract AT (11-1)-770

Descriptors: (*Cesium, Electrodialysis), (*Electrodialysis, Strontium).

EURAEC-1225 (Pt. 2) Field 11F
CFSTI Prices: HC$2.00 MF$0.50
Brussels. Univ. (Belgium).
A STUDY OF SOME METAL OXIDATION PROBLEMS AND APPLICATION OF IMPEDANCE MEASUREMENT METHODS TO THE STUDY OF RESISTANCE TO CORROSION IN AN AQUEOUS MEDIUM.
Quarterly rept. no. 10, 1 Jul - 30 Sep 64. 30 Sep 64, 24p
Contract 012-63-10 TEEB,
Proj. 289

Descriptors: (*Oxidation, Test methods), (*Corrosion resistance, Test methods).

GAT-T-1141 Field 11F, 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50
Goodyear Atomic Corp., Piketon, Ohio.
ANALYSIS OF HIGH-PURITY URANIUM METAL,
by F. S. Voss and C. F. Trivisonno. 20 Dec 63, 7p
Contract AT (33-2)-1

Descriptors: (*Uranium, Chemical analysis), (*Impurities, Uranium).

IS-T-18 Field 11F, 20C
CFSTI Prices: HC$4.00 MF$0.75
Ames Lab., Iowa State Univ. of Science and Tech.
ANTIFERROMAGNETISM IN DILUTE CHROMIUM ALLOYS.
Doctoral thesis,
by Alan LaMar Trego. May 65, 120p
Contract W-7405-eng-82

Descriptors: (*Antiferromagnetism, Chromium alloys), (*Chromium alloys, Antiferromagnetism).

ISC-640 Field 11F
CFSTI Prices: HC$2.00 MF$0.50
Ames Lab., Iowa State Univ. of Science and Tech.
APPLICATION OF METAL COATINGS ON URANIUM.
Summary rept.,
by P. Chiotti, P. F. Woerner, H. H. Klepfer, K. J. Gill, and R. E. Cutrell. 20 Sep 65, 49p
Contract W-7405-eng-82

Descriptors: (*Uranium, Metal coatings), (*Metal coatings, Uranium).

KAPL-3089 Field 11F, 20K
CFSTI Prices: HC$1.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
NOTCH SENSITIVITY OF UNIRRADIATED ZIRCALOY SUBJECTED TO BENDING FATIGUE,
by D. F. Mowbray. 10 Mar 65, 24p
Contract W-31-109-eng-52

Descriptors: (*Notch sensitivity, Zirconium alloys), (*Fatigue (Mechanics), Zirocnium alloys).

Identifiers: Zircalogy, Zircaloy-4.

KAPL-3092 Field 11F, 13H
CFSTI Prices: HC$1.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
TEMPERING BEHAVIOR OF TWO PRESSURE-VESSEL STEELS,
by D. A. Ferrill, L. J. Dinuzzo, and R. H. Oberdick. 15 Feb 65, 15p
Contract W-31-109-eng-52

Descriptors: (*Pressure vessels, Steel), (*Steel, Tempering).

MSAR-65-96 Field 11F, 18J
CFSTI Prices: HC$3.00 MF$0.75
MA Research Corp., Callery, Pa.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. ME-

CHANICAL PROPERTIES OF MATERIALS.
Quarterly progress rept. Apr-Jun 65.
6 Aug 65, 66p
Contract AT (11-1)-765

Descriptors: (*Steels, Reactor materials), (*Liquid metal coolants, Sodium), Corrosive liquids.

NCSC-2981-9 **Field 11F, 18J**
CFSTI Prices: HC$2.00 MF$0.50
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
A NUCLEAR FUEL CONSISTING OF VERY SMALL UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.
Final rept.,
by Robert F. Stoops and Mitchell W. Haller. Oct 64, 42p EURAEC-1412
Contract AT (40-1)-2981

Descriptors: (*Uranium, Reactor fuels), (*Reactor fuels, Uranium).

NMI-1267 **Field 11F, 18J, 13H**
CFSTI Prices: HC$4.00 MF$0.75
Nuclear Metals, Inc., West Concord, Mass.
FABRICATION OF SEAMLESS TUNGSTEN-25 W/O RHENIUM TUBEING. FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Summary technical rept. for 1 Jul 64-30 Jun 65,
by S. Isserow, G. I. Friedman, R. G. Jenkins andA. L. Geary. 15 Jul 65, 123p
Contract AT (30-1)-2784

Descriptors: (*Tungsten alloys, Rhenium alloys), (*Pipes, Tungsten alloys), Reactor materials, Extrusion.

NYO-2784-10 **Field 11F, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Nuclear Metals Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Monthly progress rept, Apr 65.
4 Jun 65, 6p NMI-2139
Contract AT (30-1)-2784

Descriptors: (*Metallurgy, Reactor materials), (*Reactor materials, Metallurgy), Tungsten alloys, Beryllium.

NYO-3454-1 **Field 11F**
CFSTI Prices: HC$4.00 MF$1.00
Pittsburgh Univ., Pa. Dept. of Chemistry.
THERMAL STRUCTURAL AND MAGNETIC STUDIES OF METALS AND INTERMETALLIC COMPOUNDS.
Annual rept. 15 May 64-May 15, 65,
by W. E. Wallace and R. S. Craig. 1965, 115p
Contract AT (30-1)-3454

Descriptors: (*Metals, Thermodynamics), (*Intermetallic compounds, Magnetic properties).

ORNL-P-1266 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
HYDRIDE AND BASAL POLE FIGURES IN ZIRCALOY-2 BY QUANTITATIVE METALLOGRAPHY,
by M. L. Picklesimer and P. L. Rittenhouse. 1964, 26p CONF-650414-13
Contract W-7405-eng-26
Prepared for presentation at Metallographic Group Meeting (19th), Oak Ridge, Tenn.

Descriptors: (*Zirconium alloys, Tin alloys), (*Metallography, Zirconium alloys).

Identifiers: Zircaloy-2

ORNL-P-1394 **Field 11F**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
HIGH-TEMPERATURE CHEMICAL STABILITY OF REFRACTORY-BASE ALLOYS IN HIGH VACUUM,
by D. T. Bourgette. Jun 65, 23p CONF-650617-1
Contract W-7405-eng-26
Prepared for presentation at Vacuum Metallurgy Conference, New York.

Descriptors: (*Refractory metal alloys, Stability).

ORNL-P-1430 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National fab., Tenn.
ALUMINUM AND TITANIUM CORROSION IN SALINE WATERS AT ELEVATED TEMPERATURES,
by N. G. Bohlmann and F. A. Posey. 1965, 47p CONF-651005-1
Contract W-7405-eng-26

Descriptors: (*Titanium, Corrosion), (*Aluminum, Corrosion).

Patent 3,216,781 **Field 11E, 13H**
METHOD OF SETTING WOOL TEXTILES.
Patent assigned to Agriculture,
by Clay E. Pardo, Jr., and Robert E. Foster. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Woolen textiles, Deformation), Heat treatment, Crosslinking (Chemistry), Physical properties, Processing, Water, Buffers, Amides.

Identifiers: Methylene bis-acrylamides.

Creases, folds and pleats are imparted to wool textiles by use of a solution containing solely water, N,N'methylene bis-acrylamide and a water-soluble alkaline buffering agent. Heat is applied to the fabric while deformed in a predetermined pattern to form a crease or the like.

Patent 3,216,806 **Field 11C, 11F, 18J**
OXIDATION RESISTANT COATINGS ON NIOBIUM.
Patent assigned to AEC,
by Lawrence Sama, Harry P. Kling andHarry Bender. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Niobium, Corrosion inhibition), (*Coatings, Corrosion-resistant alloys), (*Corrosionresistant alloys, Niobium alloys), (*Reactor cores, Corrosion inhibition), Tantalum alloys, Aluminum coatings, Oxidation, Patents.

The fabricable high temperature oxidation resistant alloy is for the protection of niobium base core materials. The titanium-niobium alloy consists of a 20 to 75 atomic percent titanium and the balance niobium, coated with aluminum. The nuclear properties of niobium are retained.

Patent 3,216,851 **Field 11C, 11F, 18J**
COATING FOR COLUMBIUM.
Patent assigned to AEC,
by Sanford Baranow and Ray C. Lever. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Niobium, Corrosion inhibition), (*Coatings, Corrosion-resistant alloys), (*Corrosionresistant alloys, Reactor materials), (*Reactor materials, Corrosion inhibition), Alluminum alloys, Tin alloys, Metal coatings, Oxidation, Patents.

Columbium is useful in nuclear power applications. It is protected against oxidation at elevated temperatures by dipping in a molten solution of 5 to 20 percent aluminum is tin for one to thirty minutes. The molten solution is kept at 1900 to 2300 degrees F.

Patent 3,218,270 **Field 11J, 11I**
CROSS-LINKING OF POLYMERS FROM PERFLUORODIAMIDINES AND PERFLUOROMONOAMIDINES.
Patent assigned to Navy,
by Alvin D. Delman, Alban E. Ruff andBernard B. Simms. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Heat-resistant plastics, Fluoroamines), (*Elastomers, Fluoroamines), (*Dielectrics, Fluoroamines), (*Fluoroamines, Polymers), Crosslinking (Chemistry), Amino plastics, Polymerization, Patents.

Identifiers: Perfluoro amidines.

The elastomeric dielectric compounds are capable of withstanding the high temperatures encountered in high speed space flights. The fluorocarbonamidine polymers have active groups in the polymer segments which may serve as cross-linking sites, and when cross-linked with the use of a cross-linking agent and heat provide an elastomeric dielectric product having desired high heat performance characteristics.

RL-SEP-30 **Field 11F, 18J**
CFSTI Prices: HC$4.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
CONTINUOUS ELECTROWINNING OF PLUGNIUM METAL. PROGRESS REPORT,
by M. H. Curtis. Apr 64, 103p
Contract AT (45-1)-1350

Descriptors: (*Plutonium, Separation).

SC-DC-65-1480 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Princeton Univ., N. J. Dept. of Aerospace and Mechanical Sciences.
THE COMBUSTION OF METALS.
Semi-annual progress rept. (1st), 1 Jul-31 Dec 64,
by James G. Hansel, Melvin Zwillenberg, andArthur M. Mellor. 17 Feb 65, 38p
Contract AT (30-1)-3451

Descriptors: (*Metals, Combustion), (*Combustion, Metals).

SWRI-1228-61 **Field 11F, 18M**
CFSTI Prices: HC$2.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
STUDIES OF THE FATIGUE STRENGTH OF PRESSURE VESSELS. (1) CYCLIC PRESSURE TESTS OF LARGE SIZE PRESSURE VESSELS. (2) LOW CYCLE FATIGUE TESTING OF ONE-HALF SCALE MODEL PRESSURE VESSELS. (3) EFFECT OF WELD DEFECTS ON THE FATIGUE STRENGTH OF A302B STEEL.
Progress rept. no. 14,
by A. G. Pickett, R. D. Wylie, S. C. Grigory andA. R. Whiting. 18 May 65, 47p SWRI-1228-62, SWRI-1228-63
Contract AT (11-1)-1228,
Projs. 03-1274, 03-1384

Descriptors: (*Steel, Fatigue (Mechanics), (*Pressure vessels, Steel).

TID-20986 **Field 11F, 20M**
CFSTI Prices: HC$1.00 MF$0.50
Western Reserve Univ., Cleveland, Ohio.
LOW TEMPERATURE SPECIFIC HEATS OF AGSN ALLOYS,
by Ben A. Green, Jr. and Harvey V. Culbert. 1964, 18p
Contract AT (11-1)-1108

Descriptors: (*Silver alloys, Tin alloys), (*Tin alloys, Silver alloys), Specific heat.

UCRL-13094 **Field 11A, 11F, 18J**
CFSTI Prices: HC$2.00 MF$0.50
Monsanto Research Corp., Dayton, Ohio.
RESEARCH AND DEVELOPMENT ON ADHESIVES FOR URANIUM AND THORIUM.
Annual rept., 1 Oct 62-1 Oct 63,
by D. G. Glasgow and Ival O. Salyer. 25 Nov 63, 41p
Contract W-7405-eng-48

Descriptors: (*Adhesives, Uranium), (*Thorium, Adhesives).

UCRL-16090 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
PRISMATIC LOOPS AND CLIMB KINETICS IN QUENCHED Al-1 PERCENT Mg ALLOY,
by V. C. Kannan. May 65, 44p
Contract W-7405-eng-48

Descriptors: (*Aluminum alloys, Quenching), (*Magnesium alloys, Annealing).

USBM-RC-1199 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Mines, Albany, Oreg. Metallurgy Research Center.
METALLURGY.
Quarterly progress rept. no. 27, 1 Apr-Jul 65. 31 Jul 65, 33p
Contract AT (11-1)-599

Descriptors: (*Metallurgy, Reports).

12. MATHEMATICAL SCIENCES

AD-284 854 **Field 12A, 17**
CFSTI Prices: HC$3.00
Melpar, Inc., Watertown, Mass. Applied Science Div.
APPLICATION OF RECOGNITION THEORY TO MISSILE IDENTIFICATION AND DECOY DISCRIMINATION.
12 May 61, 96p Special rept. SR-1
Contract AF30 (602)-2420,
Proj. 4983

Descriptors: (*Pattern recognition, Guided missile detection), (*Decision theory, Guided missile detection), (*Detection, Pattern recognition), (*Statistical analysis, Guided missile detection), Identification systems, Decoys, Target discrimination, Mathematical analysis.

The problem discussed is that of categorizing numerically described events in terms of a set of categories defined by correctly identified sample events. From the point of view of statistical decision-theoretical methods, classification and 'learning' through parameter estimation constitute what might be called pattern recognition.

AD-405 877 **Field 12A, 6P**
CFSTI Prices: HC$1.00
RAND Corp., Santa Monica, Calif.
DIFFERENTIAL APPROXIMATION APPLIED TO THE SOLUTION OF CONVOLUTION EQUATIONS,
by Richard Bellman, Robert Kalaba, and Bella Kotkin. May 63, 16p RM-3601-NIH
Grant PHS-RG-9608

Descriptors: (*Mathematical models, Differential equations), Difference equations, Chematherapeutic agents, Functions, Matrix calculus, Integrals, Control, Drugs, Distribution, Numerical analysis.

Identifiers: Convolution equations.

In their work on the construction of mathematical models to aid in the study of physiological processes connected with cancer chemotherapy, the authors have encountered convolution equations that may present severe computational difficulties due to the storage requirements for their solution. The authors present a new approach to this problem, using the technique of differential approximation. (Author)

AD-417 901 **Field 12B, 5J**
CFSTI Prices: HC$1.00
RAND Corp., Santa Monica, Calif.
THE SYSTEMATIC USE OF EXPERT JUDGMENT IN OPERATIONS RESEARCH,
by Olaf Helmer. Sep 63, 10p P-2795
Prepared for presentation at International Conference on Operational Research (3rd), Oslo (Norway), Jul 63.

Descriptors: (*Operations research, Decision making), Military strategy, Military tactics.

By way of a summary, let me restate as follows: (1) I consider operations research a science, but an inexact one. (2) The operations analyst, as opposed to the pure scientist, emphasizes control rather than understanding. (3) The use of judgment in constructing and applying operations-analytical models in inescapable. (4) Since the use of judgment is a sine-qua-non, such judgment should be as expert and its application as systematic as possible. (5) It would be in the interest of raising the scientific standards of operations research to seek improved methods of identifying and measuring expertness and of employing experts efficiently both solitarily and in groups. (6) In particular, the utilization of groups of experts by consensus techniques, by the Delphi technique, by simulation procedures and operational gaming, should be further refined to the point where they will be generally acceptable as part of the stock-in-trade of operations research. (Author)

HW-SA-3320 **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
ASYMPTOTIC EXPANSION OF J (AP) Y (BP) J (BP) Y (AP),
by Albert L. Ruiz. 27 Jan 64, 16p
Contract AT (45-1)-1350

Descriptors: (*Asymptotic series, Bessel functions), (*Wave functions, Asymptotic series).

LA-DC-6544 **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
FIBONACCI SPACES,
by E. D. Cashwell and C. J. Everett. 1963, 24p
Contract W-7405-eng-36

Descriptors: (*Algebra, Sequences), (*Sequences, Algebra).

LA-DC-7160 **Field 12A, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
APPLICATIONS OF A LANGUAGE FOR COMPUTING IN COMBINATORICS,
by Mark B. Wells. 1964, 7p CONF-650505-6
Contract W-7405-eng-36
Presented at IFIP Congress 1965 Meeting, New York.

Descriptors: (*Combinatorial analysis, Programming languages), (*Programming languages, Combinatorial analysis).

LA-DC-7192 **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., N. Mex.
ANALYSIS OF INHERENT ERRORS IN MATRIX DECOMPOSITION USING UNNORMALIZED ARITHMETIC,
by N. Metropolis. 1963, 6p CONF-650505-4
Contract W-7405-eng-36
Presented at IFIP Congress 1965 Meeting, New York.

Descriptors: (*Numerical analysis, Errors), (*Matrix algebra, Errors).

N65-31140 **Field 12A**
CFSTI Prices: HC$2.00 MF$0.50
Iowa State Univ., Ames.
TABLES OF ELLIPTIC INTEGRALS,
by William Joel Nellis. Aug 65, 48p
Grant NsG-293
NASA CR-289

Descriptors: (*Integrals, Tables).

PB-168 902 **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Stanford Univ., Calif. Applied Mathematics and Statistics Labs.
MULTIVARIATE BETA DISTRIBUTIONS AND INDEPENDENCE PROPERTIES OF THE WISHART DISTRIBUTION,
by Ingram Olkin and Herman Rubin. 28 Feb 63, 22p Technical rept. TR-4
Grant NSF G214

Descriptors: (*Statistical distributions, Multivariate analysis), (*Multivariate analysis, Statistical distributions), Matrix algebra, Distribution theory, Stochastic processes, Transformations (Mathematics).

Identifiers: Wishart distribution.

If X and Y are independent random variables having chi-square distributions with n and m degrees of freedom, respectively, then except for constants, X/Y and X/ (X+Y) are distributed as F and Beta variables. In the multivariate case, the Wishart distribution plays the role of the chisquare distribution. There is, however, no single natural generalization of a ratio in the multivariate case. In this paper several generalizations which lead to multivariate analogs of the Beta or F distribution are given. Some of these distributions arise naturally from a consideration of the sufficient statistic or maximal invariant in various multivariate problems, e.g., (i) testing that k normal populations are identical, (ii) multivariate analysis of variance tests, (iii) multivariate slippage problems. Although several of the results may be known as folklore, they have not been explicitly stated. Other of the distributions obtained are new. (Author)

UCRL-12041-T **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
ON NEW THEOREMS FOR ELEMENTARY NUMBER THEORY,
by Albert A. Mullin. 1963, 5p
Contract W-7405-eng-48

Descriptors: (*Theorems, Number theory), (*Number theory, Theorems).

UR-875-53 **Field 12A**
CFSTI Prices: HC$2.00 MF$0.50
Rochester Univ., N. Y. Dept. of Physics and Astronomy.
TENSOR METHODS. II. MATRIX ELEMENTS OF THE DECUPLET OPERATOR OF SU3,
by L. K. Pandit and N. Mukunda. 3 Sep 64, 48p
Contract AT (30-1)-875

Descriptors: (*Tensor analysis, Operators (Mathematics)).

WAPD-T-1764 Field 12A
CFSTI Prices: HC$6.00 MF$1.50
Pttsburgh Univ., Pa.
APPROXIMATE METHODS FOR SOLVING LINEAR AND NON-LINEAR MULTIDIMENSIONAL INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS.
Doctoral thesis,
by Ivan Itkin. 1964, 297p
Contract AT (11-1)-GEN-14

Descriptors: (*Integral equations, Numerical methods + procedures), (*Boundary value problems, Numerical methods ; procedures).

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

AD-440 189 Field 13H
CFSTI Prices: HC$4.00
General Electric Co., Syracuse, N. Y. Materials and Processes Lab.
SOLDERABILITY OF TERMINALS AND AGING.
Final rept. 1 Sep 62-31 Dec 63,
by J. A. DeVore. 31 Dec 63, 109p Rept. no. 5
Contract DA-36-039-AMC-00008 (E),
Task 702

Descriptors: (*Electric terminals, Soldering), (*Soldering, Electric terminals), Aging (Materials), Soldered joints, Electric wire, Environmental tests, Humidity, Soldering fluxes, Test methods, Acids.

This study involves two main objectives. First, to develop an artificial aging method which can be used to simulate six to 12 months of natural aging for solderable terminations. Second, to develop a solderability test method for lugs, tabs, large terminals and stranded wire; there is no test at the present time for these types of terminations. Part I of the study involved an evaluation of both naturally and artificially aged samples and an attempt at correlating the results of each evaluation. The results show that exposure to steam under controlled conditions for one hour is nearly equivalent to six months of average natural aging on common finishes. A steady state humidity condition was shown to have the next best correlation to natural aging. Part II of the study involved the evaluation of a number of techniques which could eventually be developed into a test method. In addition, two recent solderability specifications were also studied. The most successful technique for testing was a wrapped wire method, which involved the wrapping of a known 100 percent solderable wire around the part to be tested, followed by dipping the combination in a flux, soldering, and finally evaluating the fillet formed between the known and the unknown. (Author)

KAPL-M-6453 Field 13A, 20M, 14B
CFSTI Prices: HC$1.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
COMPACT HEAT EXCHANGER TEST,
by M. A. McDermott. 10 Feb 65, 17p
Contract W-31-109-eng-52,
Proj. 9-64-3-1297

Descriptors: (*Heat exchangers, Test facilities), (*Heat transfer, Test facilities).

LA-DC-6821 Field 13H, 11B, 11A
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
EPOXY RESIN BONDED MACHINABLE CERAMICS,
by Robert E. Cowan and E. P. Ehart. 1964, 18p
CONF-650513-2
Contract W-7405-eng-36
Presented at American Ceramic Society, annual meeting, Philadelphia.

Descriptors: (*Ceramic materials, Bonding), (*Epoxy plastics, Adhesives).

N65-16493 Field 13B, 6M
CFSTI Prices: HC$1.00 MF$0.50
General Mills, Inc., Minneapolis, Minn.
RESEARCH TO DETERMINE THE EXISTENCE AND IDENTITY OF VIABLE MICROORGANISMS IN THE STRATOSPHERE.
Quarterly status rept. no. 3, 19 Sep-20 Dec 63,
by V. W. Greene. 1963, 6p
Contract NASW-648
NASA CR-53951

Descriptors: (*Microorganisms, Stratosphere), (*Stratosphere, Sampling).

N65-21314 Field 13A
CFSTI Prices: HC$1.00 MF$0.50
Electro-Optical Systems, Inc., Pasadena, Calif.
CONDENSER HEAT REJECTION SYSTEMS.
Monthly progress rept. for 22 Apr-26 May 62,
by Lance Hays. 10 Jun 62, 3p EOS-1588-ML-19
Contract NAS7-11
NASA CR-57756

Descriptors: (*Condensers (Liquefiers), Heat transfer).

NYO-3363-3 Field 13I
CFSTI Prices: HC$5.00 MF$0.75
Mechanical Technology Inc., Lantham, N. Y.
AN INVESTIGATION OF ROTOR-BEARING DYNAMICS WITH FLEXIBLE ROTORS AND TURBULENT-FLOW JOURNAL BEARINGS. PART I. ANALYSIS, DESIGN AND FABRICATION OF THE TEST APPARATUS.
Rept. for Jun 64-Feb 65,
by F. K. Orcutt and E. B. Arwas. Mar 65, 76p MTI-65TR-12
Contract AT (30-1)-3363

Descriptors: (*Journal bearings, Test equipment).

Patent 3,218,313 Field 13H, 19A
METHOD AND APPARATUS FOR THERMALLY DEHYDRATING NITROCELLULOSE.
Ptent assigned to Army,
by Paul V. Blankenship. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Nitrocellulose, Dehydration), Explosive materials, Processing, Heating, Machines, Patents.

A method is provided for the thermal dehydration of explosive cellulose material utilizing a rotating filter bed having two sets of rollers. The method includes loading the nitrocellulose slurry onto the rotating filter bed by gravity or vacuum feed, and it is immediately passed under a compression roller which dewaters the nitrocellulose as much as possible. The cake then passes beneath the warm air hood at a rotation speed necessary to deliver the nitrocellulose at the desired moisture level. The final compaction and washing steps following the hot air drying are performed by a second compression roller and the alcohol spray header. The dried nitrocellulose may then be removed from the filter surface with a non-ferrous scroll cutter.

PB-168 724 Field 13F, 13B
CFSTI Prices: HC$3.00 MF$0.75
California State Div. of Highways.
W-6 LOADOMETER TRUCK WEIGHT TABLE (DEVELOPED FOR IBM-650 M.D.D.P.M.).
Electronic computer program,
by John H. Harbour. 1965, 59p
BPR Program T-3

Descriptors: (*Cargo vehicles, Load distribution), (*Programming (Computers), Civil engineering), (*Traffic, Data processing systems), (*Data processing systems, Traffic), Roads, Bridges, Loading (Mechanics), Tolerances (Mechanics), Vehicles, Weight, Tables, Flow charting, Balances, California.

Identifiers: IBM 650.

This program was developed to edit data accumulated during the annual loadometer field studies which are made to obtain information on the axle spacings and load concentrations which might overstress bridges or other highway structures and surfaces. The program compares the gross weight of the vehicle with the gross weight allowed by State law and with gross weight recommended as a limiting value by the American Association of State Highway Officials. Similarly, the load on each axle, also on each combination of axles, is compared with the corresponding State and AASHO limitations. As each comparison is made, the excess over the applicable limit is expressed as a percentage of that limit. The percentage is given one of ten code numbers according to its size for use in the output listing of violations. The type of loading that caused the maximum violation is also given a code number for use in the output tabulation. (Author)

PB-168 725 Field 13B
CFSTI Prices: HC$1.00 MF$0.50
Edwards and Kelcey, Newark, N. J.
TRAFFIC ASSIGNMENT (DEVELOPED FOR IBM-650 M.D.D.P.M.).
Electronic computer program,
by Walter Kudlick. 1960, 24p
BPR Program T-4

Descriptors: (*Traffic, Data processing systems), (*Data processing systems, Traffic), (*Civil engineering, Data processing systems), (*Roads, Traffic), Vehicles, Volume, Scheduling, Bridges, Experimental design, Programming (Computers).

Identifiers: IBM 650.

This program provides a means of determining the traffic volumes that would be attracted to a proposed freeway using Origin and Destination Survey data. The output data is of sufficient detail to provide all necessary volumes for interchange ramp design, number of freeway traffic lanes and cost benefit studies. The program as originally developed is limited to a maximum of 17 interchanges with 4 ramp quadrants per interchange. More interchanges and/or quadrants could easily be provided in any subsequent coding of this program. The American Association of State Highway Officials' traffic diversion curve is used. The program may be adapted to any time ratio diversion curve. (Author)

PB-168 726 Field 13B, 13F, 9B
CFSTI Prices: HC$2.00 MF$0.50
Washington State Dept. of Highways.
SPEED CHECK ANALYSIS (DEVELOPED FOR IBM650 M.D.D.P.M.).
Electronic computer program,
by Charlene Travis. 1965, 31p
BPR Program T-5

Descriptors: (*Roads, Experimental design), (*Traffic, Data processing systems), (*Data processing systems, Traffic), (*Civil engineering, Data processing systems), Vehicles, Velocity, Statistical analysis, Programming (Computers), Flow charting.

Identifiers: IBM 650.

This program analyzes traffic speed checks for from one to six vehicle type classifications with provision for a range of speeds from 5 to 80 miles per hour. Field work sheets, containing the field observations provide the input data. The results include 85 percentile speeds, mean speeds, standard deviation, variance, desirable sample size and the percentages of the several types of vehicles traveling at speeds greater or less than the given speeds. (Author)

PB-168 728 **Field 13B, 9B**
CFSTI Prices: HC$2.00 MF$0.50
California State Div. of Highways.
PREPARATION OF DATA FOR A TRIP DESIRE CONTOUR CHART (DEVELOPED FOR IBM-650 M.D.D.P.M.).
Electronic computer program,
by John A. Haller. 1965, 32p
BPR Program T-2

Descriptors: (*Roads, Experimental design), (*Traffic, Data processing systems), (*Data processing systems, Traffic), (*Civil engineering, Data processing systems), Vehicles, Scheduling, Public opinion, Sampling, Programming (Computers), Flow charting.

Identifiers: IBM 650.

This program was developed to produce the necessary desire-line trip density date to plot a trip desire contour chart from Origin and Destination Survey data. The survey area is processed a swath at a time until the whole area has been covered. The program embodies the principles originally set forth in a paper, 'The Coordinate Method of O and D Analysis' by K. A. MacLachlan, of the California Division of Highways, presented before the 29th annual meeting of the Highway Research Board, December 1949. (Author)

PB-168 732 **Field 13B**
CFSTI Prices: HC$4.00 MF$0.75
Bureau of Public Roads, Washington, D. C. Div. of Development.
FORECASTING INTERZONAL TRAFFIC MOVEMENTS (FRATAR METHOD).
Electronic computer program,
by W. L. Mertz. 1965, 117p
BPR Program T-1

Descriptors: (*Roads, Experimental design), (*Traffic, Data processing systems), (*Data processing systems, Traffic), (*Civil engineering, Data processing systems), Vehicles, Volume, Mathematical prediction, Programming (Computers), Flow charting.

Identifiers: Fratar method.

This group of programs has been developed for the Fratar Method of forecasting interzonal traffic volumes which utilizes a system of successive approximations, based on separate traffic growth factors for each zone. The recommended procedure for this method is described in three parts: (1) Conventional punched card equipment and externally programmed electronic computers with limited storage. (2) Intermediate size electronic computers. (3) Large high speed electronic computers. Sample calculations for a hypothetical four-zone situation are included. (Author)

PB-168 748 **Field 13B, 9B**
CFSTI Prices: HC$7.05 MF$1.75
Bureau of Public Roads, Washington, D. C. Div. of Development.
ASSIGNMENT OF TRAFFIC TO STREET AND FREEWAY SYSTEMS (DEVELOPED FOR IBM-704 E.D.P.M.).
Electronic computer program,
by W. L. Mertz. 1965, 405p
BPR Program T-6

Descriptors: (*Roads, Experimental design), (*Traffic, Data processing systems), (*Data processing systems, Traffic), (*Civil engineering, Data processing systems), Vehicles, Volume, Scheduling, Programming (Computers), Flow charting.

Identifiers: IBM 704.

PB-168 782 **Field 13F**
CFSTI Prices: HC$3.00 MF$0.75
Office of the Under Secretary for Transportation (Commerce), Washington, D. C. Transportation Research Staff.
HIGH-SPEED GROUND TRANSPORTATION RESEARCH AND DEVELOPMENT: A PRELIMINARY APPRAISAL.
1965, 69p

Descriptors: (*Transportation, State-of-the art reviews), (*Railroads, State-of-the art reviews), Research program administration, Engineering, Cost effectiveness, Roads, Traffic, Statistical data.

Identifiers: High-speed passenger transportation, Washington-Boston Corridor.

The study is concerned primarily with the technological progress of the railroad industry.

PB-168 784 **Field 13B, 6E, 8A**
CFSTI Prices: HC$7.35 MF$2.00
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIOLOGICAL PROBLEMS IN WATER POLLUTION, THIRD SEMINAR, AUGUST 31-17, 1962,
by Clarence M. Tarzwell. 1965, 433p
PHS Pub-999-WP-25

Descriptors: (*Water pollution, Marine biology), (*Sanitary engineering, Water pollution), United States Government, Public health, Biological contamination, Water supplies, Aquatic animals, Ecology, Purification, Toxicity, Wastes (Industrial), Algae, Bacteria, Protozoa, Plankton, Crustacea, Mollusca, Invertebrates, Fishes, Birds, Insects, Parasites, Herbicides, Insecticides, Pesticides, Radioactivity, Diseases, Control, Symposia.

Identifiers: Eutrophication.

Contents: Role of the aquatic biologist in the federal water pollution control program; Value and use of water quality criteria; Environmental requirements of plankton algae and their effects on water quality; Environmental requirements of freshwater invertebrates; Environmental requirements of marine invertebrates; Environmental requirements of aquatic insects; Environmental requirements of fishes and wildlife; Concentration of radionuclides in aquatic organisms, their passage through the food chain, and possible effects; Biological indicators of pollution; Organic pesticides--their detection, measurement and toxicity to aquatic life; Relation of land use to the aquatic environment; Control of fish diseases and parasites; Determination of the cause of fish kills; Artificial eutrophication of our waters; Determination of safe levels of toxicants and other pollutants in the aquatic environment.

PB-168 786 **Field 13B**
CFSTI Prices: HC$3.00 MF$0.75
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DEEP-WELL INJECTION OF LIQUID WASTE. A REVIEW OF EXISTING KNOWLEDGE AND AN EVALUATION OF RESEARCH NEEDS,
by Don L. Warner. Apr 65, 60p
PHS Pub-999-WP-21
Rept. on Environmental Health Series. Water Supply and Pollution Control.

Descriptors: (*Wastes (Industrial), Disposal), (*Sanitary engineering, Engineering geology), (*Engineering geology, Sanitary engineering), Liquids, Wastes (Sanitary Engineering), Injection, Underground structures, Water wells, Feasibility studies, Public health, Water pollution, Civil engineering.

A review of the knowledge pertinent to the use of deep wells for the subsurface injection of liquid waste has been carried out to evaluate the technical and economic feasibility and desirability of this method and to outline existing research needs. This review has shown that the deep-well injection of liquid waste is technically feasible in many areas of the country and, if properly planned and implemented, is not likely to be harmful to natural resources. While most of the technical knowledge and experience necessary to carry out the deep-well injection of liquid waste is presently available, further investigation is necessary to solve specific problems that remain as barriers to the safe, efficient, and economic use of this method. (Author)

PB-168 787 **Field 13B, 22B**
CFSTI Prices: HC$1.00 MF$0.50
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WASTE DISPOSAL ON SPACE CRAFT AND ITS BEARING ON TERRESTRIAL PROBLEMS,
by Linvil G. Rich, William Marcus Ingram, and Bernard B. Berger. Aug 65, 17p
PHS Pub-999-WP-29
Rept. on Environmental Health Series. Water Supply and Pollution Control. Prepared in cooperation with Clemson Coll., S. C.

Descriptors: (*Wastes (Sanitary engineering), Spacecraft), Urine, Excretion, Inorganic compounds, Organic compounds, Closed ecological systems, Microbiology, Disposal.

A completely regenerative system is outlined which would furnish the physiological requirements of human living in an extra-terrestrial environment. Attention is focused on processes in the system which would convert organic constituents of waste to inorganic forms. An aerobic, thermophilic, microbiological process is discussed in detail in which the conversion of organics might be accomplished very efficiently. The process would be continuous and completely mixed. A large recirculation ratio would be used, and the microorganisms in the recirculated flow would be destroyed thermally. (4 figures, 18 references) (Author)

PB-168 794 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.75
Pennsalt Chemicals Corp., Philadelphia, Pa.
ELECTROCHEMICAL TREATMENT OF MUNICIPAL WASTE WATER,
by H. C. Miller and W. Knipe. Mar 65, 62p
Grant PHS-PH-86-62-113
AWTR 13;
PHS Pub-999-WP-19

Descriptors: (*Public health, Water pollution), (*Water pollution, Purification), (*Wastes (Sanitary engineering), Electrolysis), Disposal, Wastes (Industrial), Electrochemistry, Effectiveness, Water supplies, Costs, Urban areas, United States.

Although electrolytic methods of treating waste water are reported in the older literature, their effectiveness is in doubt. This study has shown that an electrolytic treatment of secondary effluent from an activated-sludge plant using lead dioxide anodes can reduce ABS by 90 percent, COD by 80 percent, and chloride by 90 percent. This treatment has little effect on total solids. The cost of treatment will vary between $0.90 and $2.42 per 1,000 gallons. The plant costs will vary between $9 million and $26 million for a 10 mgd plant. These costs do not include site preparation, roads, landscaping, fences, land area, lighting, laboratories, or other buildings, and the costs depend on the completeness of the treatment and the electrical conductivity of the waste water. The method is not considered economically practical for wastewater renovation, wherein waters of relatively low conductivity must be processed. (Author)

PB-168 797 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.75
Radiation Applications, Inc., Long Island City, N. Y.
CONTAMINANT REMOVAL FROM SEWAGE PLANT EFFLUENTS BY FOAMING,
by Eliezer Rubin, Richard Everett, Jr. Jacques J. Weinstock and Herbert M. Schoen. Dec 63, 62p
Contract SAph-76555
AWTR 5;
PHS Pub-999-WP-5
Rept. on Environmental Health Series. Water Supply and Pollution Control.

Descriptors: (*Public health, Water pollution), (*Water pollution, Purification), (*Sewage, Decontamination), Wastes (Sanitary engineering), Wastes (Industrial), Refractory materials, Foams, Oxygen, Benzenes, Sulfonates, Cleaning compounds.

The feasibility of employing a foaming process to remove refractory materials from secondary effluents was investigated by use of both batch-foaming and continuous-feed-foaming techniques. ABS concentrations (based on methylene blue analysis) between 2.0 and 3.2 ppm in secondary effluent were consistently reduced to between 0.3 and 0.5 ppm by use of air-to-secondary effluent, volumetric-flow rate ratios between 7 and 3, correspondingly. A correlation was demonstrated between residual ABS concentration and the volume of aeration air available (at a given average bubble size) per unit mass of ABS in secondary effluent. A 10 to 45 percent diminution in COD (COD concentrations in secondary effluent averaged 118 ppm) was observed after foaming was performed. In addition, some evidence exists that COD removal increases as surfactant concentration in secondary effluent decreases. A certain minimum surfactant concentration (approx. 1 ppm) is required, however, to generate a stable foam, which provides the physical means for removing CODbearing materials. (Author)

PB-168 798 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.50
Syracuse Univ., N. Y.
WASTE-WATER RENOVATION: PART I. A DESIGN STUDY OF FREEZING AND GAS HYDRATE FORMATION. PART 2. FEASIBILITY TESTS OF FREEZING,
by Allen J. Barduhn, Arthur Rose andRobert F. Sweeny. Oct 63, 54p
Contract SAph-76969
AWTR 4;
PHS Pub-999-WP-4
Prepared in cooperation with Applied Science Labs., Inc., State College, Pa. Rept. on Environmental Health Series. Water Supply and Pollution Control.

Descriptors: (*Public health, Water pollution), (*Water supplies, Purification), Wastes (Sanitary engineering), Wastes (Industrial), Sewage, Decontamination, Freezing, Gases, Hydrates, Oxygen, Chlorides, Conductivity, Cleaning compounds, Benzenes, Sulfonates, Butane, Costs, Feasibility studies.

The freezing and gas hydrate processes for demineralizing sea water are adapted in a preliminary design to renovate municipal waste waters. Assuming a feed material containing 1,000 parts total dissolved solids per million, the author predicts costs for recovering 92 percent of the feed as potable water (250 ppm TDS). The waste stream can be further concentrated under eutectic conditions to produce more water and a waste stream of damp solids. Cost of disposal of the concentrated waste stream is not included in either case. In 14 actual freezing tests completed, chemical oxygen demand (COD) was reduced 65 to 85 percent; chlorides 85 to 90 percent; and conductivity, 90 percent or more. Reduction of alkylbenzene sulfonate (ABS) was erratic. The isobutane used as a refrigerant interfered in the COD tests. With data from the better test runs, preliminary cost estimates indicate that 95 percent of the feed water containing 10 percent of the contaminants can be recovered at a cost somewhat lower than that predicted for desalinating sea water by freezing. (Author)

PB-168 799 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.75
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
ADSORPTION OF BIOCHEMICALLY RESISTANT MATERIALS FROM SOLUTION. I,
by J. Carrell Morris and Walter J. Weber, Jr. May 64, 82p
Contract SAph-76295
AWTR 9;
PHS Pub-999-WP-11

Descriptors: (*Public health, Water pollution), (*Water supplies, Purification), Adsorption, Carbon, Molecular properties, Benzenes, Sulfonates, pH, Phenols, Particle size, Reaction kinetics, Wastes (Industrial), Wastes (Sanitary engineering), Decontamination, Equations, Equilibrium.

Studies on the kinetics of adsorption on granular carbon showed that: (1) Uptake from dilute solution proceeds slowly for compounds of high molecular weight such as tetradecylbenzenesulfonate and dodecylbenzenesulfonate; equilibrium obtains only after several weeks. (2). The rate of adsorption is a linear function of the square root of concentration, that is, a greater fraction of solute is adsorbed per unit time the more dilute the solution, which implies that the process favors removal of trace quantities. (3) Rates of adsorption decrease considerably with increasing size of adsorbate when the amount adsorbed per unit time is expressed in molar units; when expressed in weight units the effect is much less pronounced. (4) The configuration of the adsorbate molecule affects rate of uptake: molecules with highly branched structures are removed much more slowly than those of identical molecular weight but with a configuration that permits coiling or attainment of compactness. (5) Rates of adsorption per unit weight of carbon vary reciprocally as the square of the diameter of individual carbon particles. (6) The rate of adsorption of alkylbenzenesulfonates increases with decreasing pH of the solution. (Author)

PB-168 800 **Field 13B, 6M, 6E**
CFSTI Prices: HC$4.00 MF$1.00
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A LABORATORY GUIDE TO FUNGI IN POLLUTED WATERS, SEWAGE, AND SEWAGE TREATMENT SYSTEMS. THEIR IDENTIFICATION AND CULTURE,
by Wm. Bridge Cooke. Oct 63, 138p
PHS Pub-999-WP-1
Rept. on Environmental Health Series. Div. of Water Supply and Pollution Control.

Descriptors: (*Public health, Water pollution), (*Water pollution, Fungi), (*Fungi, Water pollution), (*Sewage, Purification), Yeasts, Collecting methods, Soils, Culture media, Morphology (Biology), Identification.

Techniques are described for the collection of samples of sewage, polluted waters, soils and similar substrata, and for the culturing from these of various types of filamentous fungi and yeasts. The relationships of such fungi with the habitats in which they are found are briefly discussed. Keys for the identification of different orders, families, genera, and species of fungi cultured from such materials are presented together with lists of habitats from which they have been isolated. Illustrations of most of the genera listed are presented to aid the user in completing an identification. (Author)

PB-168 837 **Field 13B, 6E**
CFSTI Prices: HC$5.00 MF$1.00
Advanced Waste Treatment Research Program, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ADVANCED WASTE TREATMENT RESEARCH PROGRAM.
Summary rept. Jan 62-Jun 64.
Apr 65, 152p AWTR-14
PHS Pub-999-WP-24
Rept. on Environmental Health Series. Water Supply and Pollution Control.

Descriptors: (*Public health, Water pollution), (*Water pollution, Purification), Water supplies, Adsorption, Foams, Electrodialysis, Osmosis, Distillation, Freezing, Ion exchange, Solvent extraction, Oxidation, Disposal, Wastes (Industrial), Wastes (Sanitary engineering), Cleaning compounds.

A wide range of physical-chemical separation processes were studied to evaluate their effectiveness in purifying municipal and industrial waste waters. Laboratory investigations showed that adsorption by granular activated carbon is an effective method of removing organic contaminants but that other materials studied as possible low-cost adsorbents failed to produce consistently effective organic removals. Laboratory and pilot plant foaming of secondary effluent removed 30 to 40 percent of the organic contaminants and 70 to 80 percent of synthetic detergents. Single-pass electrodialysis reduced the concentration of salts by 40 to 50 percent. Initial work on distillation has established that volatile contaminants carry over into the distillate to produce a detectable odor, requiring further treatment by activated carbon. Laboratory experiments on reverse osmosis indicate considerable promise for this process, but much development work remains to be done on factors such as membrane life, flux rates, and biological effects on membranes. In studies on freezing, fine ice crystals are seen to agglomerate into large or massive chunks if the ice matrix is subjected to moderate compression. The agglomeration limits the ability to wash contaminants from the ice crystals. Solvent extraction, with lowmolecular-weight secondary and tertiary amines, has produced water with an organic content of less than 10 milligrams per liter and a total dissolved solids content of less than 150 milligrams per liter.

PB-168 838 **Field 13B, 6E**
CFSTI Prices: HC$2.00 MF$0.50
Pittsburgh Chemical Co., Pa.
FEASIBILITY OF GRANULAR, ACTIVATED-CARBON ADSORPTION FOR WASTE-WATER RENOVATION.
Rept. for 20 Sep 61-19 Sep 62,
by R. S. Joyce and V. A. Sukenik. May 64, 42p

Contract SAph-86-62-15
AWTR 10;
PHS Pub-999-WP-12
Rept. on Environmental Health Series. Water Supply and Pollution Control.

Descriptors: (*Public health, Water pollution), (*Water supplies, Purification), Carbon, Adsorption, Benzenes, Sulfonates, Wastes (Industrial), Wastes (Sanitary engineering), Feasibility studies.

Granular, activated carbon in packed-bed column contactors was shown to remove much of the organic matter including alkylbenesulfonate from municipal waste water. The COD of a secondary effluent was reduced to about 12 to 20 ppm and the ABS was removed almost entirely. When an ABS break-through concentration of 0.5 ppm is used as a criterion of carbon exhaustion, the amount of carbon required for countercurrent contacting is less than 1 pound per 1,000 gallons. For the process to be economical the carbon must be reactivated and re-used. Thermal reactivation in a steam-air atmosphere was found to be technically feasible. With reactivation, the total cost of carbon adsorption was estimated to be less than 10 cents per 1,000 gallons for plants treating 10 mgd of waste water. (Author)

PB-168 840 **Field 13B, 6E**
CFSTI Prices: HC$6.00 MF$1.25
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INTERACTION OF HEAVY METALS AND BIOLOGICAL SEWAGE TREATMENT PROCESSES.
May 1965, 208p
PHS Pub-999-WP-22
Rept. on Environmental Health Series. Water Supply and Pollution Control.

Descriptors: (*Public health, Water pollution), (*Wastes (Industrial), Metals), (*Sewage, Purification), Water supplies, Wastes (Sanitary engineering), Tables.

The volume, a collection of 10 research papers originating at the Robert A. Taft Sanitary Engineering Center, describes the effects of chromium, copper, nickel, and zinc on sewage treatment processes. Results of pilot plant studies and full-scale municipal plants are given. For each of the metals and combinations of metals studied, the effects on the aerobic and anaerobic treatment processes, under continuous dosage, are given. The data presented allow a reasonable estimate to be made of the amount of metallic wastes that a treatment plant can receive and accomplish the desired efficiency of treatment. The effects of slug dis-

charges of the metals on the aerobic and anaerobic processes under pilot plant conditions and at municipal plants are presented. The concentrations of the metals in the various sludges and effluents produced by a treatment plant are given. Metal balances conducted for each of the studies show the amount of metal removed by primary and secondary treatment. (Author)

PB-168 863 **Field 13B, 6E**
CFSTI Prices: HC$5.00 MF$1.00
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CONTINUOUS AIR MONITORING PROGRAM IN CINCINNATI, 1962-1963.
Jan 65, 189p
PHS Pub-999-AP-21
Rept. on CAMP.

Descriptors: (*Public health, Air pollution), (*Air pollution, Ohio), Monitors, Sulfur compounds, Dioxides, Nitrogen compounds, Oxides, Oxidizers, Hydrocarbons, Carbon monoxides, Urban areas, Instrumentation, Tables.

Identifiers: CAMP.

The report presents results of the operation of the Public Health Service Continuous Air Monitoring Program (CAMP) in Cincinnati, Ohio, during 1962 and 1963. Data on atmospheric levels of sulfur dioxide, nitric oxide, nitrogen dioxide, total oxidants, total hydrocarbons, and carbon monoxide are analyzed and discussed. The data are tabulated as hourly, daily, and monthly mean concentrations. Background information about Cincinnati and descriptions of the instrumentation are included. (Author)

PB-168 864 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.50
Allegheny County Health Dept., Duquesne, Pa. Bureau of Air Pollution Control.
AIR POLLUTION MEASUREMENTS IN PITTSBURGH, JANUARY-FEBRUARY 1963,
by Seymour Hochheiser, Max Burchett, and Herbert J. Dunsmore. Nov 63, 54p

Descriptors: (*Air pollution, Pennsylvania), (*Public health, Air pollution), Urban areas, Atmosphere, Waste gases, Combustion products, Particles, Gas analysis, Contamination.

Identifiers: Pittsburgh.

PB-168 865 **Field 13B, 14B, 6E**
CFSTI Prices: HC$3.00 MF$0.75
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
METHODS OF MEASURING AND MONITORING ATMOSPHERIC SULFUR DIOXIDE,
by Seymour Hochheiser. Aug 64, 54p
PHS Pub-999-AP-6

Descriptors: (*Public health, Air pollution), (*Air pollution, Sulfur compounds), Diodes, Monitors, Measurement, Sampling, Instrumentation, Specifications, Test methods.

A literature review of methodology relating to the measurement of atmospheric sulfur dioxide, a detailed description of recommended methods, and criteria for selection of recommended methods are presented in this report. This publication is intended to serve as a resource document for those involved in measurement of pollution and in research on new or improved methods, and for those who seek to bring about widespread agreement in matters concerning measurement of pollution. (Author)

PB-168 871 **Field 13B, 6E**
CFSTI Prices: HC$2.00 MF$0.50
Massachusetts Dept. of Public Health, Boston. Air Pollution and Radiological Health Section.
AIR QUALITY IN BOSTON, MASSACHUSETTS, NOVEMBER-DECEMBER 1963,
by William J. Basbagill and James L. Dallas. Nov 64, 55p
Prepared in cooperation with Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

Descriptors: (*Air pollution, Massachusetts), (*Public health, Air pollution), Urban areas, Atmosphere, Contamination, Waste gases, Combustion products, Particles, Gas analysis.

Identifiers: Boston.

PB-168 872 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.75
Kansas State Board of Health, Topeka.
THE AIR RESOURCES OF KANSAS,
by Dwight F. Metzler, George G. Strella and Leroy C. Doughty. Sep 62, 97p
Prepared in cooperation with Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.

Descriptors: (*Air pollution, Kansas), Public health, Population, Industries, Agriculture, Wastes (Industrial), Disposal, Meteorological parameters, Climatology, Law, Economics, Urban areas, Rural areas, Sampling.

Contents: General factors influencing the air resources of Kansas; Meteorological factors; Sources of air pollution in Kansas; Effects of air pollution; Air sampling activities; Regional and local problems; Legislation.

PB-168 873 **Field 13B, 6E**
CFSTI Prices: HC$3.00 MF$0.75
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CLEAN AIR FOR CHATTANOOGA,
by Thomas E. Kreichelt and Gene B. Welsh. Jul 64, 78p

Descriptors: (*Public health, Air pollution), (*Air pollution, Tennessee), Smokes, Fuels, Wastes (Industrial), Disposal, Soils, Particles, Dust, Sulfur compounds, Nitrogen compounds, Oxides, Carbon monoxide, Sulfides, Hydrogen compounds, Meteorological parameters, Terrain, Sampling.

Atmospheric pollutants of primary concern in Chattanooga are: (1) Smoke from improper combustion of coal with a relatively high volatile matter content, and to a lesser degree, smoke from improper combustion of fuel oil, (2) dusts and other particulate materials and orders from certain industrial activities, and (3) fly ash from combustion of coal having a comparatively high ash content. The improper combustion of fuels occurs in space-heating plants of residential and commercial facilities and in connection with certain industrial processes. Pollutants of secondary concern are gases from various combustion operations and gases, fumes, and solvent vapors from industrial and commercial activities. In addition, emissions from motor vehicles, smoke from open burning of leaves and the burning of construction and demolition debris, and emissions from improper burning of refuse at industrial, commercial, apartment house, and institutional establishments are also of importance.

PB-168 874 **Field 13B, 21D, 6E**
CFSTI Prices: HC$4.00 MF$0.75
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ATMOSPHERIC EMISSIONS FROM FUEL OIL COMBUSTION; AN INVENTORY GUIDE,
by Walter S. Smith. Nov 62, 103p
PHS Pub-999-AP-2
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Public health, Air pollution), (*Air pollution, Fuel oil), (*Fuel oil, Air pollution), Combustion, Combustion products, Smokes, Nitrogen compounds, Oxides, Sulfur compounds, Dioxides, Particle size, Reviews.

The review provides a guide for the inventorying and control of emissions arising from the combustion of fuel oil. Information was collected from the published literature and other sources. The report is limited to information on oil used as a source of heat or power (exclusive of process heaters). The data were abstracted, assembled, and converted to common units of expression to facilitate understanding. From these data, emission factors were established that can be applied to fuel oil combustion to determine the magnitude of air-contaminating emissions. Also discussed are the compositions of fuel oils; the preparation and combustion of fuel oil; and the rates of emission, their variables, and their control. (Author)

PB-168 878 **Field 13B, 6E**
CFSTI Prices: HC$2.00 MF$0.50
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE NOVEMBER-DECEMBER 1962 AIR POLLUTION EPISODE IN THE EASTERN UNITED STATES,
by D. A. Lynn, B. J. Steigerwald and J. H. Ludwig. Sep 64, 30p
PHS Pub-999-AP-7
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Air pollution, United States), Meteorological parameters, Urban areas, Public health, Gases, Contamination, Anticyclones, Atmospheric motion, Sampling.

The report documents the subject 'episode' with respect to meteorology, air quality, and public reaction. Particulate and gaseous air quality data are reported and discussed. Meteorology and public reaction are discussed with reference to the Public Health Service program of Air Pollution Potential Forecasts. Epidemiological aspects are not considered. (Author)

PB-168 914 **Field 13J, 8J**
CFSTI Prices: HC$2.00 MF$0.50
Woods Hole Oceanographic Institution, Mass.
PRELIMINARY CRUISE REPORT, ATLANTIS II, CRUISE 8, INTERNATIONAL OCEAN EXPEDITION, JULY 5, 1963-DECEMBER 20, 1963,
by Arthur R. Miller and R. W. Risebrough. 1963, 33p Ref-64-11
Grant NSF-GP-821

Descriptors: (*Oceanographic vessels, Performance (Engineering)), Oceanology, Indian Ocean, Atlantic Ocean, Hydrographic surveying, Tables.

Identifiers: Atlantis II.

PB-168 940 **Field 13M, 5C, 4B**
CFSTI Prices: HC$6.00 MF$1.25
Travelers Research Center, Inc., Hartford, Conn.
THE OPERATIONAL AND ECONOMIC IMPACT OF WEATHER ON THE CONSTRUCTION INDUSTRY OF THE UNITED STATES.
Final rept.,
by J. A. Russo, Jr., K. Trouern-Trend, R. H. Ellis, R. C. Koch, and G. M. Howe. Mar 65, 242p
Rept. no. 7665-163
Contract Cwb-10948

Descriptors: (*Weather forecasting, Industrial research), (*Industrial research, Weather forecasting), (*Economics, Weather forecasting), Meteorological parameters, Interference, Compatibility, Construction, Civil engineering.

The study categorizes the construction industry and describes construction operations; determines those segments of the industry influenced by weather; assesses the weather information needed by these sensitive segments to reduce adverse effects; and assesses the Weather-service products currently available to satisfy this need. Also, the needs for specific modification or development of additional weather information are identified. An estimate is made of the dollar losses to the U. S. industry caused by both seasonal weather fluctuation and intermittent (daily) weather effects. Losses caused by unemployment, idle or non-productive equipment, and decrease in annual construction volume are estimated for seasonal weath-

er fluctuations, while losses pertaining to perishable materials, on-site wages, equipment, and overhead and profits are estimated for intermittent weather effects. The potential reduction in loss (i.e., the benefits) through appropriate use of the recommended weather-information (product) package and improvement in forecasting accuracy is also assessed in relation to seasonal fluctuation and intermittent weather. The study also assesses and recommends educational programs and methods to inform construction engineers and decision-makers of Weatherservice products and the ways of using them to reduce the effects of adverse weather. (Author)

PB-168 966 **Field 13H**
CFSTI Prices: HC$2.00 MF$0.50
California Univ., Berkeley.
ENERGY BALANCE IN ELECTRIC-ARC WELDING.
Master's thesis,
by Ralph Hirsh Zusman. 1958, 46p
Grant NSF-G1457

Descriptors: (*Arc welding, Inert gas welding), Energy, Effectiveness, Welding rods, Electrodes, Electric arcs, Performance (Engineering), Voltage.

The effect of various atmospheres on the Inert-GasShielded Metal-Arc process is discussed. Data are presented showing the utilization of energy in forming the iron weld-nugget, which constitutes the weld joint in practice. The energy losses encountered in the process are also considered. Possible reasons for the effects of the various atmospheres on the current-voltage characteristics, burn-off rates, and loss of weld metal are considered. The discussion and results which are presented point to the following indications: The energy utilized in depositing the electrode for all atmospheres is approximately 80% of the total energy input. The balance is lost to radiation, conduction, convection, spatter, etc. For any given total energy input, the amount of metal deposited depends on the atmosphere used. The general properties of the arc are a function of the atmosphere and of the mechanism of metal transfer in each atmosphere. (Author)

RL-SA-20 **Field 13C**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
EFFECTS OF HIGH TEMPERATURE EXPOSURE ON CONCRETE,
by Harold S. Davis. 16 Feb 65, 3p CONF-650602-2
Contract AT (45-1)-1350
Presented at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Concrete, High temperature research), (*High temperature research, Concrete).

SROO-260-6 **Field 13A, 20M**
CFSTI Prices: HC$6.00 MF$1.25
Michigan Univ., Ann Arbor. Heat Transfer Lab.
LOW HEAT-FLUX BOILING OUTSIDE VERTICAL AND HORIZONTAL TUBES.
Final technical rept.,
by John A. Clark, Herman Merte, Jr., William C.Elrod, and Edward R. Lady. Mar 65, 232p
Contract A,38-1)-260,
Proj. ORA-04653

Descriptors: (*Pipes, Heat transfer), (*Heat transfer, Pipes).

TID-21790 **Field 13H, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Aircraft Nuclear Engine Lab.
PRODUCTION DEVELOPMENT OF Cb-1 Zr ALLOY TUBING,
by L. M. Raring. 6p
Contract AT (11-1)-229

Descriptors: (*Pipes, Industrial Production), (*Niobium alloys, Zirconium alloys).

TIM-916 **Field 13I, 18N**
CFSTI Prices: HC$2.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
SINGLE FILM JOURNAL BEARING TESTS IN WATER,
by B. Weinberg. Jul 65, 28p
Contract AT (30-1)-2789

Descriptors: (*Journal bearings, Tests).

TIM-929 **Field 13K, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
DIRECT CURRENT ELECTROMAGNETIC PUMP ANALYSIS,
by J. H. McConville. 8 Jul 65, 31p
Contract AT (30-1)-2789

Descriptors: (*Electromagnetic pumps, Analysis).

WCAP-3269-10 **Field 13A**
CFSTI Prices: HC$3.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
STEAM GENERATOR WATER LEVEL CONTROL,
by Amir N. Nahavandi and Abram Batenburg.
Dec 64, 52p
Contract AT (30-1)-3269

Descriptors: (*Liquid level control, Steam power plants), (*Gas generating systems, Steam).

Y-1478 **Field 13D, 14B**
CFSTI Prices: HC$6.00 MF$1.25
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
COMPENDIUM OF GAS AUTOCLAVE ENGINEERING STUDIES,
ed. by C. E. Muzzall. 2 Nov 64, 233p
Contract W-7405-eng-26

Descriptors: (*Pressure vessels, Gases), (*High-temperature research, Materials).

Identifiers: Autoclaves.

14. METHODS AND EQUIPMENT

AD-465 904 **Field 14E, 15D**
CFSTI Prices: HC$4.00 MF$1.00
Rome Air Development Center, Griffiss AFB, N. Y. Reconnaissance Intelligence Data Handling Branch.
EFFECT OF THE UNIT RECORD MOUNT AND PROCESSING ON 70mm X 100mm FILM CHIPS.
Final rept.,
by John G. Santoro. Apr 65, 109p RADC-TR-65-36
Proj. OSR-406

Descriptors: (*Photographic reconnaissance, Data processing systems), Photographic film, Handling, Storage, Processing, Documentation, Abrasives, Photographic images, Degradation, Data storage systems.

The effort involved the determination of the effect of various types of Unit Record Mounts upon photographic film chips during the storage-retrieval and handling processes. The objectives of this effort were to determine: (1) Number, size and location of scratches produced on the film chips by the various Unit Record Mount Configurations. (2) Number, size and location of scratches and impurities produced on film chips as a result of exposure, processing and cutting. (3) The effect of scratches and impurities on the imagery within the unit reocrds. (4) The most suitable Unit Record mount configuration for use in the manipulation of film chips. (Author)

AD-466 091 **Field 14B, 8M**
CFSTI Prices: HC$4.00 MF$1.00
Winslow Labs., Rensselaer Polytechnic Inst., Troy, N. Y.
DEVELOPMENT OF SOIL PRESSURE GAGES,
by Emmericus C. W. A. Geuze and Robert Y. K. Cheng. Mar 65, 142p
Contract NBy-32240

Descriptors: (*Pressure gages, Soils), (*Soils, Pressure gages), Pressure, Measurement, Stability, Elasticity, Test methods, Freezing, Shear stresses, Stresses, Strain (Mechanics), Spheres.

This report describes a soil pressure measuring system which involves quick-freezing a zone of soil in the 'free-field,' excavating a cavity in the frozen zone, suspending a triaxially sensitive pressure gage in the cavity, and surrounding the gage with a liquid which changes to an elastic solid before the solid thaws. An auxiliary procedure is determination of insitu soil stress-strain properties in thawed cavities carved from frozen zones surrounding the point at which future pressure measurement will be made. A triaxially sensitive spherical gage was developed and tested. Equipment for freezing a zone of soil was tested, and a cavity trimming tool was successfully used. Suitable room-temperature-vulcanizing silicone rubber compounds were formulated which would solidify in the frozen environment. A concept was developed, but not tested, for a device to perform the auxiliary determination of soil stress-strain properties. Also included in the report is a brief review of soil pressure measurement techniques. (Author)

AD-467 338 **Field 14E, 15D**
CFSTI Prices: HC$2.00 MF$0.50
Rome Air Development Center, Griffiss AFB, N. Y. Reconnaissance Intelligence Data Handling Branch.
OSR OPERATIONAL REQUIREMENTS WHICH DEFINE THE STORAGE-RETRIEVAL IDENTIFICATION NUMBER SYSTEM RATIONALE.
Final rept.,
by John G. Santoro. Jul 65, 42p RADC-TR-65-115
Proj. OSR-406

Descriptors: (*Identification systems, Photographic intelligence), (*Photographic intelligence, Input-output devices), Information retrieval, Data storage systems, Handling, Photointerpretation, Automatic.

This effort involved the determination of an Identification Number System for identifying Unit Record chip images produced under OSR 406 Photo Exploitation Complex. The salient operational characteristics of OSR 406 were considered in the determination of the Identification Number System. The analysis and evaluation of these parameters resulted in the selection of an Identification Number System which consists of twentyseven alpha-numeric characters utilized to represent six categories of information. Each of the six categories of information convey memonic information relating to the image within each unit record film chip. This Identification Number System is also not affected by the amount of non-automated or automated support existent within an organization. (Author)

N65-21319 **Field 14D**
CFSTI Prices: HC$3.00 MF$0.75
ARINC Research Corp., Washington, D. C.
ANALYSIS OF SPECIFICATION SYSTEMS FOR THE PROCUREMENT OF HIGH-RELIABILITY PARTS.
Final rept.,
by Bryce Sigmon. May 64, 76p
Contract NASw-831
NASA CR-57941

Descriptors: (*Procurement, Specifications), (*Specifications, Procurement).

Patent 3,216,257 **Field 14B, 4B**
HIGH PRESSURE GAS DEW POINT INDICATOR.
Patent assigned to Navy,
by Stephen H. Ford. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Dew point, Meters), (*Meters, Dew point), Gases, Patents, High-pressure research, Recording systems, Phototubes.

The device is for measuring the water content of a gas flowing through a tube at high pressures. Quartz lenses are mounted on the tube. A light source is positioned adjacent to one of the two lenses. Apparatus is provided for injecting liquid nitrogen into the gas upstream of the lenses. A photoelectric cell, positioned adjacent the second lens, produces an electrical signal in accordance with the amount of light passing through the lens. The output of the cell is amplified and transmitted to a meter.

PB-168 627 **Field 14E, 12A, 9B**
CFSTI Prices: HC$3.00 MF$0.75
American Mathematical Society, Providence, R. I.
DEVELOPMENT OF THE PHOTON FOR EFFICIENT MATHEMATICAL COMPOSITION.
Final rept.
10 May 65, 66p
Grant NSF-G21913

Descriptors: (*Punched tape, Printing), (*Printing, Mathematics), (*Mathematics, Printing), Photography, Programming (Computers), Effectiveness, Costs.

Identifiers: Photocomposition.

This report describes the work done on the Photon study by the American Mathematical Society, and also some work done by other organizations working in the field of photocomposition. The description of experimental work performed includes work on tape composition, including the use of function codes, the problem of justification, development of equipment modifications made by the Society, and work done on the composition of mathematical tables, both by use of tape punched on a Flexowriter and tape obtained from computers. A list is given of the books and journal issues composed on the Photon, with examples of the work. Since the project originally included as an objective that particular emphasis would be put on the composition of Mathematical Reviews, the reasons for abandoning this aspect for the present are given. Cost analyses of Photon Composition of mathematical text are given. The work done on the design of a disc for mathematical composition is described. This includes a survey of the characters needed for mathematical composition, and a study of the criteria and objectives to be observed in actually designing the type. A section on the preparation of pi-mats is also included. The basic problems of tape controlled mathematical composition systems are discussed, including proofreading, editing, correcting, and creation of displays. The last section of the report proposes further study which should be undertaken to develop the use of the Photon more fully, by use of a computer in the preparation of tape for controlling the Photon. An appendix includes a Manual for Copy Preparation and Keyboarding Mathematical Texts. (Author)

PB-168 854 **Field 14E**
Haloid Co., Rochester, N. Y.
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly progress rept. no. 1, 15 Jun-15 Sep 48,
by R. M. Schaffert, D. T. Williams, L. E. Walkup and C. D. Oughton. 15 Sep 48, 81p
Contract W-36-039-sc-36851
ATI 178 559
Availability: Reference only at CFSTI after original stock is exhausted. Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also AD-623 412.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrophotography), Selemium, Photographic film, Sensitivity, Electrostatics, Photoconductivity, Photographic images.

Contents: Electrometers for testing plate surface potential; Apparatus to measure the photographic characteristic of electrophotographic plates; Spectral sensitivity of selenium-coated electrophotographic plates; Design and construction of a temperaturecontrol platen for vacuum evaporation; Heat treatment of vacuum-evaporated selenium-coated electrophotographic plates; Effect of volatile foreign material on vacuum-evaporated selenium electrophotographic plates; Compilation of a list of materials reported to be photoconductive; Investigation of materials reported to be photoconductive; Preparation of electrophotographic plate on aluminum-coated paper; Preliminary-calculations of electrophotographic plate sensitivity; Preliminary analysis of photoconductivity and a crucial experiment; Analysis of decay-rate curves of seleniumpainted plates.

PB-168 856 **Field 14E**
Haloid Co., Rochester, N. Y.
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly progress rept. no. 5, 15 Jun-15 Sep 49,
by R. M. Schaffert, D. T. Williams and L. E. Walkup.
15 Sep 49, 92p
Contract W-36-039-sc-36851,
Projs. DA-3-99-04-052, SC-195B
ATI 66 157
Availability: Reference only at CFSTI after original stock is exhausted. Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 857.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrophotography), Photographic film, Selenium, Photographic images, Electrostatics, Photoconductivity, Phosphorescent materials, Zinc compounds, Sulfides, Binders.

Contents: Experiments on continuous-tone development; Factors affecting the characteristics of evaporated selenium plates; Measurements of selenium-plate characteristics; Alternative methods of preparing selenium plates; Electrophotographic plates using materials other than selenium.

PB-168 857 **Field 14E**
Haloid Co., Rochester, N. Y.
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly progress rept. no. 6, 15 Sep-15 Dec 49,
by R. M. Schaffert, D. T. Williams and L. E. Walkup.
15 Dec 49, 77p
Contract W-36-039-sc-36851,
Projs. DA-3-99-04-052, SC-195B
ATI 178 566
Availability: Reference only at CFSTI after original stock is exhausted. Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 858.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrophotography), Photographic images, Photographic film, Selenium, Adhesives, Phosphorescent materials, Photographic equipment, Binders, Electrostatics, Photoconductivity.

Contents: Experiments on continuous-tone development; Adhesive fixing and transferring; Selenium platepreparation work; Phosphor-coated electrophotographic plates; New apparatus.

PB-168 858 **Field 14E**
Haloid Co., Rochester, N. Y.
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly progress rept. no. 7, 15 Dec 49-15 Mar 50,
by R. M. Schaffert, D. T. Williams and L. E. Walkup.
15 Mar 50, 96p
Contract W-36-039-sc-36851,
Projs. DA-3-99-04-052, SC-195B
ATI 209 056
Availability: Reference only at CFSTI after original stock is exhausted. Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 859.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrophotography), (*Cameras, Electrophotography), Photographic images, Photographic film, Adhesives, Vapor plating, Vacuum apparatus, Selenium, Phosphorescent materials, Electrostatics, Photoconductivity.

Contents: Engineering information for design of electrophotographic camera; Experimental work on powder-cloud boxes; Experiments on charging, exposure, and development; Alternative continuous-tone development methods; Adhesive transfer and fixing; Experiments on vacuum-evaporated selenium plates; Phosphor-coated electrophotographic plates.

PB-168 859 **Field 14E**
Haloid Co., Rochester, N. Y.
APPLICATION OF ELECTROSTATIC ELECTROPHOTOGRAPHY TO MICROFILM ENLARGEMENT.
Final progress rept., 20 Jun 49-30 Jun 51,
by C. F. Carlson, J. H. Dessauer, H. E. Clark, C. R. Mayo and E. R. Sabel. 30 Jun 51, 145p
Contract W-36-039-sc-36851,
Projs. DA-39-2705A-4, SC-195B
ATI 122 527
Availability: Reference only at CFSTI after original stock is exhausted. Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 858.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrophotography), (*Photographic equipment, Electrophotography), Photographic film, Photographic images, Cleaning, Photographic printers, Microfilm, Photographic processors, Electrostatics, Photoconductivity, Instruction manuals, Maintenance.

Contents: Characteristics of corona charging; Exposure; Development; Transfer; Methods of image fixing; The cleaning of xerographic plates; Machine development problems; Development model, xerographic microfilm printer; Development model, xerographic print fixer.

PB-168 947 **Field 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
INFRARED TEST SET MODEL NO. 486900-100, TYPE AN/AAM-6 (HUGHES).
15 Oct 65, 22p NAVWEPS-17-20QAB-2

Descriptors: (*Infrared equipment, Test sets), (*Test sets, Calibration), Test equipment, Instruction manuals, Test methods.

The manual contains instructions for calibration of the Infrared Test Set, Model 486900-100.

PB-169 028 **Field 14B, 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
SPECTRUM ANALYZER PANORAMIC SPA-4.
Technical manual instrument calibration procedure, GW-02.
1 Sep 65, 19p NAVWEPS-17-20GW-02

Descriptors: (*Radiofrequency spectroscopy, Spectrum analyzers), (*Spectrum analyzers, Calibration), Instruction manuals, Test methods.

The Panoramic SPA-4 spectrum analyzer provides a visual means of analyzing modulated or

unmodulated radio-frequency signals at frequencies from 10 to 44,000 Mc.

PB-169 038 **Field 14B, 20D**
CFSTI Prices: HC$2.00 MF$0.50
Stanford Univ., Calif. Dept. of Civil Engineering.
A WIND, WATER-WAVE RESEARCH FACILITY,
by E. Y. Hsu. Oct 65, 45p Technical rept. TR-57
Grant NSF-GP-2401

Descriptors: (*Hydrodynamics, Test facilities), (*Physics laboratories, Hydrodynamics), Water waves, Wind, Hydraulic models, Water tunnels, Instrumentation, Model basins.

This report describes the design, construction, and capabilities of a new wind, water-wave channel at Stanford University. The channel is 115 feet long, 74 1/2 inches high, and 35 1/2 inches wide. The test section is glasswalled and 85 feet long. An oscillating-plate wave generator actuated by a hydraulic power system is located at one end of the channel. The wave generator is capable of generating arbitrary wave forms. An air inlet is located in front of the generator; a suction fan and absorbing beach are located at the other, downstream end of the channel. Mean free-stream air velocities of 80 fps can be obtained with 3 feet nominal water depth in the channel. (Author)

UCRL-7925-T **Field 14B**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
COMMENTS ON PUMPING METHODS FOR OBTAINING ULTRAHIGH VACUUM,
by Norman Milleron. 4 Jun 64, 9p
Contract W-7405-eng-48

Descriptors: (*Vacuum pumps, Controlled atmospheres).

UCRL-9672 (rev) **Field 14B, 18D, 20M**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
SENSITIVE DIFFERENTIAL PRESSURE SYSTEM FOR MEASURING DEPTHS OF CRYOGENIC LIQUIDS,
by William L. Pope and Edwin F. McLaughlin. 26 Aug 64, 8p
Contract W-7405-eng-48

Descriptors: (*Liquids, Pressure gages), (*Cryogenics, Liquids).

WERL-15 **Field 14B**
CFSTI Prices: HC$1.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Research Labs.
ULTRAHIGH VACUUM TECHNIQUES.
Quarterly progress rept., 1 Jul-30 Sep 64,
by W. J. Lange and J. H. Singleton. 1964, 12p
RR-64-9E1-441-R-2
Contract AT (30-1)-2823

Descriptors: (*Vacuum, Scientific research), (*Vacuum apparatus, Test methods).

WERL-2823-17 **Field 14B**
CFSTI Prices: HC$2.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Research Labs.
ULTRAHIGH VACUUM TECHNIQUES.
Annual rept., 1 Jan-31 Dec 64,
by W. J. Lange and J. H. Singleton. 1964, 48p
RR-65-9E1-441-R2
Contract AT (30-1)-2823

Descriptors: (*Vacuum apparatus, Test methods), (*Vacuum, Scientific research).

WERL-2823-18 **Field 14B**
CFSTI Prices: HC$1.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Research Labs.
ULTRAHIGH VACUUM TECHNIQUES.
Quarterly progress rept., 1 Jan-31 Mar 65,
by W. J. Lange and J. H. Singleton. 28 Apr 65, 13p
Contract AT (30-1)-2823

Descriptors: (*Vacuum, Scientific research), (*Vacuum apparatus, Test methods).

17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

N65-34434 **Field 17G, 22D**
CFSTI Prices: HC$3.00 MF$0.75
National Aeronautics and Space Administration, Huntsville, Ala. Marshall Space Flight Center.
A GENERAL DESCRIPTION OF THE ST124-M INERTIAL PLATFORM SYSTEM,
by Herman E. Thomason. Sep 65, 93p
NASA TN-D-2983

Descriptors: (*Stabilized platforms, Launch vehicles (Aerospace)), (*Launch vehicles (Aerospace), Stabilized platforms).

PB-169 030 **Field 17G**
CFSTI Prices: HC$3.00 MF$0.75
National Aviation Facilities Experimental Center, Atlantic City, N. J. Test and Evaluation Div.
AREA COVERAGE DISPLAYS AND COURSE LINE COMPUTERS EXPERIMENTATION.
Final rept.,
by G. Adams, D. Brandewie, and R. Harter. Oct 65, 90p
Proj. 115-7X
SRDS 65-117

Descriptors: (*Air traffic control systems, Display systems), Flight testing, Simulation, Distance-measuring equipment, Air traffic controllers, Navigation computers, Flight instruments.

Identifiers: VORTAC.

Pictorial displays and course-line computers, driven by VORTAC receivers, were tested to appraise the value of area navigation in the Air Traffic Control System. Technical and operational aspects were tested in fixed-wing aircraft and by simulation in the laboratory. This report touches on results from simulation but concentrates on the description of flight tests. From Air Traffic Control simulations, it was concluded that the controller workload may be reduced and his ability to manipulate traffic increased. Flight tests proved that the addition of area displays to VORTAC receivers enhances the usefulness of DME in VORTAC. Off-radial flight accuracies are comparable to the now existing radial accuracies. (Author)

18. NUCLEAR SCIENCE AND TECHNOLOGY

AD-466 691 **Field 18H, 13B**
CFSTI Prices: HC$6.00 MF$1.25
Merrimack Coll., North Andover, Mass. Div. of Engineering.
EVALUATION OF FALLOUT CONTAMINATION OF WATER SUPPLIES.
Final technical rept., 1 Oct 63-15 May 65,
by Werner N. Grune and Henry S. Atlas. 15 May 65, 232p
Contract OCD-PS-64-62,
Task 3131B

Descriptors: (*Radiological contamination, Water supplies), (*Water supplies, Radiological contamination), Radioactive fallout, Radiation hazards, Urban areas, Mathematical models, Permissible dosage, Particle size, Rainfall, Nuclear explosions, Surface burst, Countermeasures, Sorption, Radiochemistry, Decontamination kits, Absorption (Biological).

A theoretical evaluation was conducted to determine the potential degree of water contamination from fallout and to assess the biological hazards associated with the ingestion of water following hypothetical nuclear attack. The appraisal was carried out by applying the assigned fallout model to various levels of nuclear war and by quantitative correlation of all phases of the flow of radioactive fallout in public water supplies. The water supply systems of three cities were selected for the evaluation of water contamination to study the potential hazards and radiobiological effects from the ingestion of fallout contaminated water. These results indicate that water contamination for some cities may be at a substantial level of activity concentration, especially when watershed runoff is included. A detailed analysis of various criteria for biological uptake was completed. Results from four mathematical models of biological uptake have been summarized and were found to be in close agreement with each other. The possible internal hazard due to ingestion of contaminated water for the populations residing in the three selected cities was estimated. The values of the absorbed doze for total body for different starting times and ingestion periods have been summarized. (Author)

BNL-9289 **Field 18H, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Brookhaven National Lab., Upton, N. Y.
EFFECT OF IRRADIATION ON DISLOCATION MOBILITY IN IRON-STUDIED BY STRAIN RELAXATION,
by J. G. Y. Chow and R. Rosenberg. 1965, 8p
CONF-650904-5
Contract AT (30-2)-GEN-16

Descriptors: (*Radiation damage, Iron), (*Crystal lattice defects, Radiation damage).

BNWL-SA-119 **Field 18D, 6R**
CFSTI Prices: HC$1.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
MULTIDIMENSIONAL GAMMA RAY SPECTROMETRY AND ITS USE IN BIOLOGY,
by Julian M. Nielsen and Harry A. Kornberg. 24 Mar 65, 14p CONF-650507-35
Contract AT (45-1)-1830
Presented at IAEA Symposium on Radioisotope sample Measurement Techniques in Medicine and Biology, Vienna.

Descriptors: (*Gamma-ray spectroscopy, Radiobiology), (*Radiobiology, Gamma-ray spectroscopy).

BNWL-SA-5 **Field 18D**
CFSTI Prices: HC$2.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
THE HANFORD EMERGENCY DOSIMETRY SYSTEM,
by Harold V. Larson and Arthur R. Keene. 1965, 27p CONF-650302-20
Contract AT (45-1)-1350
Presented at IAEA Symposium on Personnel Dosimetry for Accidental High-Level Exposure to External and Internal Radiation, Vienna.

Descriptors: (*Dosimeters, Reactor accidents).

BNWL-SA-9 **Field 18F**
CFSTI Prices: HC$2.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
ENVIRONMENTAL EXPOSURE AS A FUNCTION OF CONTAINMENT VESSEL LEAKAGE RATE,
by E. C. Watson and N. G. Wittenbrock. 25 Mar 65, 8p CONF-650407-9
Contract AT (45-1)-1830

Prepared for presentation at International Symposium on Fission-Product Release and Transport under Accident conditions, 5-7 Apr 65, Oak Ridge, Tenn.

Descriptors: (*Containment, Fission products), (*Reactor safety systems, Nonleakage probability).

CEND-3336-223 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
Combustion Engineering, Inc., Windsor, Conn. Nuclear Div.
DEVELOPMENT AND TESTING OF A TEMPERATURE TRANSIENT METHOD FOR PERFORMING IN-PILE THERMAL CONDUCTANCE TESTING.
Progress rept. for 1 Jul-30 Sep 64,
by C. E. BURDG, J. R. Parrette, R. I. Brockett, andW. P. Chernock. Oct 64, 28p EURAEC-1241
Contract AT (30-1)-3336

Descriptors: (*Reactor fuel elements, Thermal conductivity), (*Thermal conductivity, Test methods).

CONF-641201-2 **Field 18F, 7A**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
SHIPMENT OF A LARGE LIQUID SOURCE -- A CASE HISTORY,
by F. A. Ernest and R. Maher. Dec 64, 13p
Contract AT (07-2)-1
Prepared for presentation to Symposium on shipment of radioactive materials Annual Meeting (57th) Boston.

Descriptors: (*Radioactive isotopes, Transportation), (*Containment, Reactor materials).

CONF-650904-3 **Field 18J, 18L**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
IRRADIATION BEHAVIOR OF URANIUM METAL TUBES IN A PRESSURIZED HEAVY WATER REACTOR,
by C. L. Angerman and W. R. McDonell. Jul 65, 21p
Contract AT (07-2)-1
Prepared for presentation at Symposium on Radiation Effects, Asheville, N. C., 8-10 Sep 1965.

Descriptors: (*Reactor fuel cladding, Radiation damage), (*Heavy water reactors, Power reactors).

COO-280 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
Chicago Operations Office, Atomic Energy Commission, Ill.
INSPECTION OF THE ELK RIVER CONTROL RODS, NOVEMBER 5 THROUGH 9, 1964,
by D. E. Simpson and W. G. Albert. Dec 64, 37p

Descriptors: (*Control rods, Boiling water reactors), (*Reactor inspection, Control rods).

CVNA-236 **Field 18I, 18L**
CFSTI Prices: HC$2.00 MF$0.50
Carolinas Virginia Nuclear Power Associates, Inc., Parr, S. C.
MONTHLY OPERATING REPORT, May 1965.
1965, 32p
Contract AT (30-1)-2289

Descriptors: (*Heavy water reactors, Reactor operation).

DPSPU-63-30-39 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
QUALITY CONTROL OF MODERATOR IN SAVANNAH RIVER PLANT REACTORS,
by G. N. Flannagan and R. F. Anderson. Jan 64, 8p CONF-179-17
Contract AT (07-2)-1
Prepared for presentation at American Chemical Society Radionuclidic Exchange on Soils, Minerals, and Resins, Philadelphia, Apr. 1964.

Descriptors: (*Reactor moderators, Quality control), (*Production reactors, Reactor moderators).

DPSPU-63-30-40 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
IMPURITIES IN MODERATOR OF SAVANNAH RIVER PLANT REACTORS,
by F. B. Longtin. Jan 64, 9p CONF-179-18
Contract AT (07-2)-1
Prepared for presentation to American Chemical Society Radionuclidic Exchange on soils, minerals, and resins, Philadelphia, Apr. 1964.

Descriptors: (*Reactor moderators, Impurities), (*Production reactors, Reactor moderators).

DPSPU-64-30-1 **Field 18H**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY.
Semiannual rept., Jul-Dec 63.
Feb 64, 18p
Contract AT (07-2)-1

Descriptors: (*Radioactivity, Environmental tests), (*Environmental tests, Production reactors).

DPSPU-64-30-3 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
PROGRESS IN HEALTH PHYSICS INSTRUMENTS,
by C. N. Wright. Apr 64, 14p CONF-642-23
Contract AT (07-2)-1
Prepared for presentation to Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Health physics instrumentation, Scientific research).

DPSPU-64-30-4 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
SAVANNAH RIVER PLANT BIOLOGICAL MONITORING PROGRAM,
by R. S. Harvey. May 64, 7p CONF-642-2L
Contract AT (07-2)-1
Prepared for presentation to Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Radiation monitors, Production reactors), (*Biology, Radiation monitors).

DPSPU-64-30-8B **Field 18G**
CFSTI Prices: HC$1.00 MF$0.50
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Plant.
A METHOD FOR DISPOSAL OF LARGE QUANTITIES OF DEGRADED AND LOW LEVEL CONTAMINATED SOLVENT,
by J. A. Harper and L. Jolly, Jr. May 64, 12p CONF-642-31
Contract AT (07-2)-1
Prepared for presentation to Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Radioactive waste, Disposal).

EURAEC-1178 **Field 18I**
CFSTI Prices: HC$3.00 MF$0.75
Allgemeine Elektrizitaetsgesellschaft, Frankfurt am Main (West Germany).
STABILITY TESTS FOR BOILING-WATER REACTOR.
Quarterly rept. no. 1, 1 Apr-30 Jun 64.
30 Jun 64, 52p
Contract 020-64-4 TEED

Descriptors: (*Boiling water reactors, Stability), (*Reactor control, Test methods).

EURAEC-1194 **Field 18K**
CFSTI Prices: HC$2.00 MF$0.50
Commissariat a l'Energie Atomique, Fontenay-Aux-Roses. Centre Detudes Nucleaires.
OSCILLATION OF URANIUM FUEL SLUGS IN MARIUS.
Special rept. no. 20, Jul - Aug 63,
by O. Tretiakoff, R. Vidal, J. C. Carre, andM. Robin. May 64, 49p
Proj. 209

Descriptors: (*Reactor fuel elements, Oscillation), (*Reactor reactivity, Perturbation theory).

EURAEC-1198 **Field 18J, 18K**
CFSTI Prices: HC$3.00 MF$0.75
Commissariat a l'Energies Atomique, Saclay (France). Centre d'Etudes Nucleaires.
MARIUS. MEASUREMENTS OF SPECTRUM INDICES IN THE LATTICES OF 224 AND 317 MM PITCH.
Special rept. no. 23,
by F. Cogne and J. Journet. May 64, 87p
Contract 037-60-12

Descriptors: (*Reactor lattice parameters, Neutron spectrum.

EURAEC-1200 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
Technische Hogeschool, Eindhoven (Netherlands).
HEAT TRANSFER AND MIXING STUDIES IN A PWRREACTOR-LOOP.
Quarterly progress rept. no. 2, 1 Apr 64-1 Jul 64.
Aug 64, 15p
Contract 11-63-9 TEEN

Descriptors: (*Pressurized water reactors, Heat transfer), (*Fluid flow, Pressurized water reactors).

EURAEC-1219 **Field 18K**
CFSTI Prices: HC$2.00 MF$0.50
Allgemeine Elektrizitaetsgesellschaft, Frankfurt am Main (West Germany).
STABILITY TESTS FOR BOILING WATER-REACTORS.
Quarterly rept. no. 2, 1 Jul - 30 Sep 64.
30 Sep 64, 40p
Contract 020-64-4-TEED,
Proj. 306

Descriptors: (*Boiling water reactors, Thermal stability).

EURAEC-1231 **Field 18L**
CFSTI Prices: HC$1.00 MF$0.50
Societa Elettronucleare Nazionale, Rome (Italy).
RESEARCH PROGRAM FOR THE GARIGLIANO NUCLEAR POWER PLANT.
Rept. no. 2.
1 Oct 64, 8p
Contract 101-63-11-RDI

Descriptors: (*Nuclear power plants, Scientific research), (*Boiling water reactors, Nuclear power plants).

EURAEC-1290 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
Technische Hogeschool, Eindhoven (Netherlands).
THE STEADY STATE AND DYNAMIC BEHAVIOUR OF A BOILING WATER REACTOR.
Quarterly progress rept. no. 15, 1 Jul - 1 Oct 64.
1 Oct 64, 19p WW016-R78
Contract P-313

Descriptors: (*Boiling water reactors, Dynamics).

EURAEC-1332 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
Technische Hogeschool, Eindhoven (Netherlands).
HEAT TRANSFER AND FLUID FLOW CHARACTERISTICS IN A PRESSURIZED WATER REACTOR.
Quarterly progress rept. no. 4, 1 Oct 64 - 1 Jan 65.
Jan 65, 21p EUR-2309
Contract 011-64-1 TEEN (RD)

Descriptors: (*Pressurized water reactors, Heat transfer), (*Fluid flow, Pressurized water reactors).

EURAEC-1333 **Field 18J, 11F**
CFSTI Prices: HC$2.00 MF$0.50
Centre Detude de Lenergie Nucleaire, Mol (Belgium).
SELLING OF URANIUM.
Rept. for 1 Apr 62-30 Sep 63.
30 Sep 63, 44p EUR-2310
Contract 087-62-4 RDB

Descriptors: (*Uranium, Thermal properties), (*Reactor fuel elements, Uranium).

GA-4124 **Field 18L, 18E**
CFSTI Prices: HC$2.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
EXPERIMENTAL BERYLLIUM OXIDE REACTOR PROGRAM.
Quarterly progress rept. for 31 Mar 63.
26 Apr 63, 42p
Contract AT (04-3)-187

Descriptors: (*Nuclear power plants, Gas-cooled reactors), (*Gas cooled reactors, Nuclear power plants), Beryllium compounds, Apids.

GA-4675 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab.
RESEARCH ON GRAPHITE.
Quarterly progress rept. for period ending 30 Sep 63,
by R. J. Price and J. L. White. 31 Oct 63, 47p
Contract AT (04-3)-167

Descriptors: (*Graphite, Microstructure), (*Microstructure, Graphite).

GA-4710 **Field 18J**
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
ADVANCED BERYLLIUM OXIDE CONCEPTS.
Progress rept. 1 Jul-30 Sep 63.
15 Nov 63, 58p
Contract AT (04-3)-187

Descriptors: (*Reactor materials, Beryllium compounds), (*Beryllium compounds, Oxides).

GA-4966 **Field 18J**
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
ADVANCED BERYLLIUM OXIDE CONCEPTS.
Progress rept. 1 Oct-31 Dec 63.
29 Jan 64, 69p
Contract AT (04-3)-187

Descriptors: (*Reactor materials, Beryllium compounds), (*Beryllium compounds, Oxides).

GA-5036 **Field 18J**
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
ADVANCED BERYLLIUM OXIDE CONCEPTS.
Progress rept for period ending 31 Mar 64.
30 Apr 64, 51p
Contract AT (04-3)-187

Descriptors: (*Reactor materials, Beryllium compounds), (*Beryllium compounds, Oxides).

GA-5305 **Field 18J, 18K**
CFSTI Prices: HC$3.00 MF$1.00
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
GRAPHITE INTERFACE STUDIES.
Technical summary rept. 16 May 63-15 May 64,
by R. Bardes, J. Neill, and J. A. Young. 15 May 64, 93p
Contract AT (04-3)-167

Descriptors: (*Graphite, Neutron transport theory), (*Neutron transport theory, Graphite).

GA-5411 **Field 18K, 18L**
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, John Jay Hopkins Lab. for Pure and Applied Science.
BURNUP INDEPENDENT POWER SHAPING BY FUEL ZONING,
by K. R. Van Howe. 28 Oct 64, 19p CONF-654-35
Contract AT (04-3)-167,
Proj. 317.2320
Presented at the American Nuclear Society Meeting, San Francisco, Calif. Nov-Dec 64.

Descriptors: (*Reactor power density, Fuel burnup).

GA-5418 **Field 18D, 9B**
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
CAP -- A COLLIMATOR ANALYSIS PROGRAM,
by Henry C. Honesk. 16 Jul 64, 20p
Contract AT (04-3)-167

Descriptors: (*Collimators, Radiation measurement systems), (*Programming (Computers), Radiation measurement systems).

GA-5487 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
ADVANCED BERYLLIUM OXIDE CONCEPTS.
Quarterly progress rept. for period ending 30 Jun 64.
1 Aug 64, 40p
Contract AT (04-3)-187

Descriptors: (*Reactor materials, Beryllium compounds), (*Beryllium compounds, Oxides).

GA-5734 **Field 18J, 20B, 11F**
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
A PROGRAM OF BASIC RESEARCH ON MECHANICAL PROPERTIES OF REACTOR MATERIALS.
Annual summary rept for 1 Oct 64,
by R. H. Chambers, T. A. Trozera and J. L. White.
15 Jan 65, 100p
Contract AT (04-3)-167

Descriptors: (*Reactor materials, Mechanical properties), Crystal lattice defects, Refractory metals, Single crystals.

GA-6134 **Field 18L**
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
40-MW (E) PROTOTYPE HIGH-TEMPERATURE GASCOOLED REACTOR. POSTCONSTRUCTION RESEARCH AND DEVELOPMENT PROGRAM.
Quarterly progress rept for period ending 31 Jan 65.
26 Feb 65, 10p
Contract AT (04-3)-314

Descriptors: (*Gas-cooled reactors, Reactor operation), (*Power reactors, Gas-cooled reactors).

GA-6290 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
MEASUREMENTS AND CALCULATIONS OF THE SLOWING DOWN AND MIGRATION TIME,
by A. E. Profio, J. U. Koppel, andA. Adamentiades. 5 Apr 65, 22p CONF-650504-12
Contract AT (04-3)-167
Presented at the IAEA Symposium on Pulsed Neutron Methods, Karlsruhe, Germany, May 65.

Descriptors: (*Neutron transport theory, Reactor moderators), (*Reactor moderators, Neutron transport theory).

GA-6291 **Field 18K, 20H**
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
NEUTRON SPECTRA IN H2O, D2O, BeO, AND CH2,
by J. M. Neill, J. C. Young, G. D. Trimble, andJ. R. Beyster. 5 Apr 65, 17p CONF-650504-13
Contract AT (04-3)-167
Presented at the IAEA Symposium on Pulsed Neutron Methods, Karlsruhe, Germany May 65.

Descriptors: (*Reactor moderators, Neutron spectrum), (*Neutron spectrum, Neutron scattering).

GA-6295 **Field 18K, 20H**
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
DIFFERENTIAL NEUTRON SCATTERING FROM HYDROGENEOUS MODERATORS,
by J. R. Beyster, J. C. Young, J. M. Neill, andW. R. Mowry. 6 Mar 65, 20p CONF-650504-14
Contract AT (04-3)-167
Presented at the IAEA Symposium on Pulsed Neutron Methods, Karlsruhe, Germany May 65.

Descriptors: (*Reactor moderators, Neutron cross sections), (*Thermal utilization, Differential cross section).

GA-6313 Field 18K, 20H
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
NEUTRON SPECTRA IN BULK MEDIA BY TIME-OF-FLIGHT,
by J. L. Russell, Jr., J. R. Beyster, G. K. Houghton, K. L. Crosbie and J. R. Brown. 9 Apr 65, 22p CONF-650504-11
Presented at the Iaea Symposium on Pulsed Neutron Methods, Karlsruhe, Germany May 65.

Descriptors: (*Neutron spectrum, Reactor materials), (*Reactor materials, Neutron spectrum).

GA-6462 Field 18K, 9B
CFSTI Prices: HC$3.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
A SURVEY OF SEVERAL METHODS FOR COMPUTING CELL CROSS SECTIONS,
by H. Fenech, A. Goodjohn, and G. C. Pomraning. 16 Jun 65, 52p
Contract AT (04-3)-187

Descriptors: (*Reactor shielding calculations, Reactor materials), (*Programming (Computers, Reactor shielding calculations)).

GAMD-2309 Field 18I
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif.
EBOR CORE ELEMENT TEMPERATURES FOLLOWING A LOSS-OF-COOLANT ACCIDENT,
by R. Katz. 8 Jun 61, 61p
Contract AT (04-3)-187

Descriptors: (*Reactor accidents, Reactor coolants), (*Reactor cores, Temperature).

GAMD-4732 Field 18L
CFSTI Prices: HC$2.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
PRELIMINARY TARGET STEAM GENERATOR DESIGN STUDY,
by H. F. Menzel. 29 Oct 63, 31p
Contract AT (04-3)-167,
Proj. 317.1100

Descriptors: (*Power reactors, Design), (*Steam power plants, Power reactors).

GAMD-5272 (Rev. 2) Field 18I, 13D
CFSTI Prices: HC$2.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
TARGET PRESTRESSED CONCRETE STRUCTURE NUMERICAL STRESS ANALYSIS OF PLEXIGLAS CEILING MODEL,
by D. C. Cornell. 20 Nov 64, 34p
Contract AT (04-3)-167,
Proj. 317.2410

Descriptors: (*Pressure vessels, Stresses), (*Reactor system components, Concrete).

GAMD-5432 Field 18I, 18J
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
THERMAL PROTECTION OF CONCRETE PRESSURE VESSEL BY LAMINATED INSULATION AND INTERNAL COOLING,
by L. Cavallaro. Jun 64, 44p
Contract AT (04-3)-167

Descriptors: (*Pressure vessels, Thermal insulation), (*Thermal insulation, Reactor system components).

GAMD-5503 Field 18I, 13D, 14B
CFSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
PLEXIGLAS MODEL OF A THICK-WALLED VESSEL: EXPERIMENTAL AND NUMERICAL ANALYSIS,
by C. Riparbelli. 31 Aug 64, 22p
Contract AT (04-3)-167,
Proj. 317

Descriptors: (*Pressure vessels, Stresses), (*Acrylic resins, Models (Simulations)).

GAMD-5535 Field 18J
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
GAIL IV IRRADIATION ASSEMBLY DESIGN SUMMARY AND INFORMATION DATA PACKAGE,
by E. O. Winkler. 11 Aug 64, 71p
Contract AT (04-3)-167,
Proj. 317.2124

Descriptors: (*Reactor fuel elements, Test methods).

GAMD-5926 Field 18J
FSTI Prices: HC$1.00 MF$0.50
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
ITERATIVE TECHNIQUE FOR THE STRESS ANALYSIS OF PCR STRUCTURES USING THE FINITE ELEMENT METHOD,
by D. C. Cornell. 30 Nov 64, 21p
Contract AT (04-3)-167,
Proj. 317.2410

Descriptors: (*Reactor system components, Stresses), (*Stresses, Iterative methods).

GAMD-6109 Field 18J, 12A
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
A METHOD FOR DETERMINING THE OPTIMAL TENDON CONFIGURATION IN A PRESTRESSED CONCRETE REACTOR STRUCTURE,
by D. C. Cornell. 23 Oct 64, 57p
Contract AT (04-3)-167,
Proj. 317

Descriptors: (*Reactor system components, Concrete), (*Linear programming, Stresses).

GAMD-6145 Field 18J
CFSTI Prices: HC$2.00 MF$0.50
General Atomic, San Diego, Calif.
ADVANCED HTGR FUEL ELEMENT VIBRATION TESTS,
by R. J. Kiefer and T. R. Sparks. 29 Dec 64, 34p
Contract AT (04-3)-167

Descriptors: (*Reactor fuel elements, Vibration), (*Vibration, Test methods).

GAMD-6276 Field 18I, 9B
CFSTI Prices: HC$3.00 MF$0.75
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
PRECON. A FORTRAN PROGRAM FOR COMPUTING CONTAINMENT PRESSURE,
by R. H. Hansen. 31 Mar 65, 53p
Contract AT (04-3)-167,
Proj. 317

Descriptors: (*Containment, Pressure), (*Programming (Computers), Reactor operation).

GEAP-4597 Field 18J, 11F
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
AEC FUEL CYCLE PROGRAM EXAMINATION OF U02 FUEL RODS OPERATED IN THE VB WR TO 10,000 MWD/TU,
by H. E. Williamson, C. J. Baroch, J. P. Hoffmann, and D. I. Ikeuye. 15 Mar 65, 268p
Contract AT (04-3)-189

Descriptors: (*Reactor fuel rods, Boiling water reactors), (*Test methods, Reactor fuel rods).

GEAP-4772 Field 18J
CFSTI Prices: HC$7.00 MF$2.25
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
EVESR-NUCLEAR SUPERHEAT FUEL DEVELOPMENT PROJECT. DARE CODE FOR THE THERMAL HYDRAULIC FUEL PERFORMANCE EVALUATION,
by B. G. Atraz. Jan 65, 395p
Contract AT (04-3)-189

Descriptors: (*Reactor fuel elements, Thermal properties), (*Performance (Engineering), Reactor fuel elements).

HW-SA-3212 Field 18K, 20M
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
EXPERIMENTS ON THE THERMAL CONDUCTIVITY OF UO2 AT HANFORD LABORATORIES,
by J. L. Bates, D. R. De Halas, J. O. McPartland, M. H. Montgomery, and J. A. Christensen. 23 Sep 63, 15p
Contract AT (45-1)-1350

Descriptors: (*Thermal conductivity, Uranium compounds), (*Uranium compounds, Oxides).

HW-SA-3330 Field 18K, 20H
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
DETERMINATION OF FAST-NEUTRON SPECTRA IN N-REACTOR CORE BY EXPERIMENTAL AND ANALYTICAL METHODS,
by R. E. Dahl and J. A. Ulseth. 8 Jul 64, 17p
Contract AT (45-1)-1350

Descriptors: (*Reactor cores, Fast neutrons), (*Fast neutrons, Neutron spectrum).

HW-SA-3469 Field 18J
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
SCINTILLATION AND NEUTRON FISSION TECHNIQUES FOR NONDESTRUCTIVE TESTING OF LOW LEVEL URANIUM CONTAMINATION ON N REACTOR FUEL,
by Charles N. Jackson, Jr. Mar 65, 33p
Contract AT (45-1)-1350

Descriptors: (*Reactor fuel elements, Nondestructive testing), (*Fission, Scintillation).

HW-SA-3519 Field 18B
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
CALORIMETRIC DETERMINATION OF THE HALF LIFE ON ANTIMONY-124,
by D. M. Fleming and I. T. Myers. 1 Jun 64, 5p

Contract AT (45-1)-1350

Descriptors: (*Antimony, Half life), (*Half life, Calorimetry).

HW-SA-3525 **Field 18D, 20H**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
NEUTRON SPECTRUM MEASUREMENTS AT HANFORD WORK LOCATIONS,
by G. W. R. Endrea. 15 May 64, 31p CONF-642-33
Contract AT (45-1)-1350
Presented at Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Neutron spectrum, Dosimeters), (*Dosimeters, Neutron spectrum).

HW-SA-3526 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
THE STATUS OF NEW PERSONNEL NEUTRON DOSIMETER DEVELOPMENT,
by C. M. Unruh. 15 May 64, 12p CONF-642-34
Contract AT (45-1)-1350
Presented at Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Dosimeters, Neutron counters).

HW-SA-3541 **Field 18H, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
IN-PILE DOSIMETRY FOR RADIATION DAMAGE STUDIES,
by H. H. Yoshikawa. 2 Jun 64, 20p
Contract AT (45-1)-1350

Descriptors: (*Radiation damage, Reactor system components), (*Radiation measurement systems, Fast neutrons).

HW-SA-3560 **Field 18B**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
REACTOR DECONTAMINATION AND THE HEALTH PHYSICIST, HEALTH PHYSICS SOCIETY, CINCINNATI, JUNE 1964,
by L. R. Wallis, M. L. Smith, and F. E. Owen. 1963, 9p CONF-642-30
Contract AT (45-1)-1350

Descriptors: (*Reactor system components, Decontamination), (*Health physics, Reactor hazards).

HW-SA-3626 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
IRRADIATION TESTING IN SUPPORT OF THE PU-RECYCLE DEMONSTRATION EXPERIMENT IN EBWR,
by W. J. Bailey. 9 Nov 64, 30p CONF-654-33
Contract AT (45-1)-1350
Prepared for presentation at American Nuclear Society Meeting, San Francisco, Nov-Dec 1964.

Descriptors: (*Reactor fuel rods, Radiation damage), (*Boiling water reactors, Reactor fuel rods).

HW-SA-3637 **Field 18K, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
REACTOR SAFETY SYSTEM MECHANISM,
by J. F. Nesbitt. 24 Jul 64, 7p
Contract AT (45-1)-1350

Descriptors: (*Production reactors, Reactor safety systems), (*Reactor safety systems, Reactor operation).

HW-SA-3664 **Field 18H, 11B**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
DIMENSIONAL STABILITY OF LOW-PERMEABILITY GRAPHITES DURING HIGH-TEMPERATURE IRRADIATION TO HIGH EXPOSURES,
by R. E. Dahl. 8 Sep 64, 15p
Contract AT (45-1)-1350

Descriptors: (*Radiation damage, Graphite), (*Graphite, Stability).

HW-SA-3995 **Field 18F**
CFSTI Prices: HC$2.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
CLASS I SHIPPING CONTAINER FOR FISSILE MATERIAL,
by C. L. Brown. 22 Dec 64, 45p CONF-650103-4
Contract AT (45-1)-1350
Prepared for presentation to International Symposium on Packaging and Transportation of Radioactive Material, Albuquerque, N. Mex.

Descriptors: (*Subcritical assemblies, Containers), (*Containers, Transportation).

HW-61979 **Field 18E**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
LEAKAGE FROM ZONE I AND II OF 105-N,
by G. E. Wade. 16 Sep 59, 13p
Contract AT (45-1)-1350

Descriptors: (*Confinement, Production reactors).

HW-69168 **Field 18F, 18J**
CFSTI Prices: HC$4.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
PLUTONIUM RECYCLE CRITICAL FACILITY FINAL SAFEGUARDS ANALYSIS. SUPPLEMENT,
ed. by F. Swenberg. Oct 64, 113p
Contract AT (45-1)-1350

Descriptors: (*Reactor safety systems, Critical assemblies), (*Critical assemblies, Plutonium).

HW-72219 **Field 18J, 5C**
CFSTI Prices: HC$3.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
URANIUM PRICE SCHEDULES AND BRED FUEL VALUES,
by E. A. Ezchbach and M. F. Kanninen. Dec 64, 82p
Contract AT (45-1)-1350

Descriptors: (*Reactor fuels, Costs), (*Economics, Reactor fuels).

HW-75728 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
THERMAL HYDRAULIC ANALYSIS OF PRTR FUEL ELEMENTS AT 1800 KW TUBE POWER,
by G. M. Hesson and J. M. Batch. 3 Dec 62, 17p
Contract AT (45-1)-1350

Descriptors: (*Reactor fuel elements, Test reactors), (*Thermal analysis, Reactor fuel elements).

HW-76195 **Field 18I**
CFSTI Prices: HC$7.91 MF$4.00
Hanford Atomic Products Operation, Richland, Wash.
PLUTONIUM AND U233 VALUES COMPUTED FOR SUCCESSIVE RECYCLE IN FIVE SIMULATED REACTOR TYPES,
by D. E. Deonigi, M. F. Kanninen and A. P. McConiga. 2 Jan 63, 491p
Contract AT (45-1)-1350

Descriptors: (*Reactor fueld, Reactor operation), (*Nuclear reactors, Simulation).

HW-77274 **Field 18G**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
BURIAL OF HANFORD RADIOACTIVE WASTES,
by G. E. Backman, P. C. Jerman, R. E. Roberts, andJ. W. Vanderbeek. 15 Apr 63, 13p
Contract AT (45-1)-1350

Descriptors: (*Radioactive waste, Disposal).

HW-79572 **Field 18K**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
STUDY OF THE CHAIN REACTION IN PLUTONIUM,
by E. D. Clayton. 8 Nov 63, 39p
Contract AT (45-1)-1350

Descriptors: (*Reactor kinetics, Plutonium).

HW-80814 **Field 18G**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
RECOVERY OF AMMONIUM CARBONATE FROM CESIUM ION EXCHANGE ELUATES,
by W. J. Van Slyke. 12 Feb 64, 13p
Contract AT (45-1)-1350

Descriptors: (*Isotope separation, Radioactive waste), (*Ion exchange, Cesium).

HW-81256-1 **Field 18J, 18I**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
DESIGN CRITERIA FOR PIPELINE TRANSFER FACILITIES FOR PROMETHIUM PROCESSING AT THE STRONTIUM SEMIWORKS,
by W. W. Olson. 9 Sep 64, 8p
Contract AT (45-1)-1350

Descriptors: (*Reactor fuel processing, Promethium), (*Pipes, Design).

HW-81780 **Field 18J, 13H**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operations, Richland, Wash.
AN IMPROVED EDDY CURRENT TUBING TEST,
by H. L. Libby. 7 May 64, 31p
Contract AT (45-1)-1350

Descriptors: (*Electric currents, Nondestructive testing), (*Non-destructive testing, Reactor system components).

HW-81933 **Field 18H, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
RECYCLED THORIUM DOSE RATES,
by F. E. Owen. 15 May 64, 11p
Contract AT (45-1)-1350

Descriptors: (*Dose rate, Thorium), (*Thorium, Reactor fuel processing).

HW-82043 **Field 18K**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PHYSICS STATIC CALCULATION RECIPES FOR PLUTONIUM BURNERS,
by P. L. Hofmann, G. J. Busselman andR. H. Holeman. 28 Apr 64, 36p

Descriptors: (*Reactor kinetics, Plutonium).

HW-82369 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
RADIATION MONITORING OF PERSONNEL BY DOSE RATE TELEMETERING,
by M. L. Smith and P. J. Norvath. 8 Jun 64, 18p
CONF-642-32
Contract AT (45-1)-1350
Prepared for presentation at Health Physics Society, Cincinnati, June 1964.

Descriptors: (*Radiation monitors, Scientific personnel), (*Dose rate, Telemetering data).

HW-82658 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
MEASUREMENT OF GAMMA HEATING IN PRTR. TEST 82,
Final rept.,
by G. A. Fick. 8 Jun 64, 11p
Contract AT (45-1)-1350

Descriptors: (*Heavy water reactors, Heating), (*Gamma rays, Heating).

HW-82797 **Field 18I, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PROCESS CONTROLLER SIMULATOR FOR FAST ANALOG SIMULATIONS,
by G. G. Thiems. Nov 64, 23p
Contract AT (45-1)-1350

Descriptors: (*Analog computers, Reactor operation).

HW-83092 (rev) **Field 18I, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
TIME-VARIABLE TIME DELAY FOR ANALOG COMPUTERSIMULATIONS,
by R. A. Walker. Dec 64, 29p
Contract AT (45-1)-1350
N65 19668

Descriptors: (*Analog computers, Simulation), (*Reactor control, Simulation).

HW-83296 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
ANALOG COMPUTER SIMULATION FOR A PRCF LIGHT WATER PU STUDY,
by C. Metelmann. 14 Jul 64, 20p

Descriptors: (*Critical assemblies, Simulation), (*Analog computers, Plutonium).

HW-83298 **Field 18I**
CFSTI Prices: HC$5.00 MF$1.00
Hanford Atomic Products Operation, Richland, Wash.
RESEARCH AND DEVELOPMENT PROGRAMS EXECUTED FOR THE DIVISION OF REACTOR DEVELOPMENT.
Quarterly progress report, Apr-Jun 64,
ed. by J. K. Green. Nov 64, 200p
Contract AT (45-1)-1350

Descriptors: (*Nuclear reactors, Scientific research).

HW-83337 **Field 18J, 9B, 18M**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
TTR ANALOG COMPUTER SIMULATION,
by C. Metelmann. 22 Jul 64, 15p
Contract AT (45-1)-1350

Descriptors: (*Thermal reactors, Simulation), (*Analog computers, Simulation).

HW-83501 (pt 2) **Field 18J, 18I**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PRTR CONTAINMENT VESSEL PRESSURE TEST EXPERIENCE. PART II,
by D. R. Koberg. 10 Nov 64, 18p
Contract AT (45-1)-1350

Descriptors: (*Containment, Pressure vessels), (*Heavy water reactors, Test reactors).

HW-83610 **Field 18G**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PROGRESS IN RADIOACTIVE RESIDUE PROCESS DEVELOPMENT. A SUMMARY OF HANFORD LABORATORIES ACHIEVEMENTS IN THIS PROGRAM UNDER GENERAL ELECTRIC, 1958-1964,
by A. M. Platt and C. R. Cooley. Nov 64, 36p
Contract AT (45-1)-1350

Descriptors: (*Radioactive waste, Processing).

HW-83615 **Field 18H, 18J, 11F**
CFSTI Prices: HC$3.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
PROGRESS ON THE IRRADIATION DAMAGE TO REACTOR METALS PROGRAM. A SUMMARY OF HANFORD LABORATORIES ACHIEVEMENTS IN THIS PROGRAM UNDER GENERAL ELECTRIC COMPANY MANAGEMENT, 1962-1964,
by J. C. Tobin. 15 Dec 64, 56p
Contract AT (45-1)-1350

Descriptors: (*Radiation damage, Reactor materials), (*Reactor materials, Metals).

HW-83668 **Field 18E**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
A REVIEW OF RESEARCH ON PLUTONIUM RELEASES DURING OVERHEATING AND FIRES,
by J. Mishima. Aug 64, 22p
Contract AT (45-1)-1350
N65 19669

Descriptors: (*Plutonium, Heating).

HW-83716 **Field 18F**
CFSTI Prices: HC$4.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
ANALYSIS OF PRIMARY LOOP EMERGENCY COOLING TEST DATA OBTAINED DURING START-UP TESTING OF N-REACTOR,
by H. G. Johnson. 1 Sep 64, 111p
Contract AT (45-1)-1350

Descriptors: (*Reactor safety systems, Test methods).

HW-83854 **Field 18D, 9F**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
RADIOTELEMETERING NETWORK DATA STATIONS INSTRUCTION MANUAL,
by C. A. Ratcliffe and E. M. Sheen. 24 Sep 64, 46p
Contract AT (45-1)-1350

Descriptors: (*Radiation measurement systems, Telemeter systems), (*Telemeter systems, Instruction manual).

HW-83896 **Field 18G, 18J**
CFSTI Prices: HC$4.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
SOLIDIFICATION OF HIGH-LEVEL RADIOACTIVE FUEL REPROCESSING WASTES BY SPRAY AND POT CALCINATION -- HOT-CELL PILOT PLANT STUDIES,
by R. T. Allemann, F. P. Roberts and U. L. Upson. Sep 64, 97p
Contract AT (45-1)-1350

Descriptors: (*Reactor fuel processing, Solids), (*Radioactive waste, Processing).

HW-83899 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
EDDY CURRENT TESTING REPORT FOR N-REACTOR DUMP CONDENSERS,
by J. C. Spanner, R. L. Brown, Jr., and R. W. Moss. 2 Sep 64, 21p
Contract AT (45-1)-1350

Descriptors: (*Reactor system components, Test methods).

HW-84082 **Field 18J, 18M**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PLUTONIUM RECYCLE TEST REACTOR PLUTONIUM CALCULATIONS,
by J. W. Handshuh. 14 Sep 64, 17p
Contract AT (45-1)-1350

Descriptors: (*Test reactors, Plutonium), (*Plutonium, Reactor materials).

HW-84105 **Field 18G**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
REMOVAL OF CESIUM FROM REDOX ALKALINE SUPERNATANT WASTES BY ION EXCHANGE,
by K. C. Knoll. 1 Oct 64, 16p
Contract AT (45-1)-1350

Descriptors: (*Isotope separation, Radioactive waste), (*Ion exchange, Cesium).

HW-84196 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.

RECLAIMING OF INNER FUELS WITH CRACKED SUPPORTS,
by W. G. Hudson. 18 Sep 64, 11p
Contract AT (45-1)-1350

Descriptors: (*Reactor fuel processing, Reactor system components).

HW-84214 **Field 18I, 18M**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
OBSERVATIONS CONCERNING NPR FLOW RESTRICTORS,
by D. H. White. 25 Sep 64, 9p
Contract AT (45-1)-1350

Descriptors: (*Production reactors, Fluid flow).

HW-84369 **Field 18K**
CFSTI Prices: HC$3.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
PHYSICS RESEARCH.
Quarterly rept., Jul - Sep 64.
15 Oct 64, 62p
Contract AT (45-1)-1350

Descriptors: (*Reactor kinetics, Critical assemblies), (*Critical assemblies, Reactor kinetics).

HW-84440 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
EXAMINATION OF FLAWS IN PRTR ZIRCALOY-2 PRESSURE TUBES,
by M. C. Fraser. 14 Oct 64, 15p
Contract AT (45-1)-1350

Descriptors: (*Reactor system components, Defects (Materials)), (*Defects (Materials, Test reactors), Zirconium alloys, Pipes.

HW-84481 **Field 18D, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
A MONITOR FOR RADIOIODINE IN REACTOR COOLING WATER,
by H. G. Rieck. 5 Nov 64, 13p
Contract AT (45-1)-1350

Descriptors: (*Reactor coolants, Radiation measurement systems), (*Radioactive isotopes, Iodine).

HW-84540 **Field 18H, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
POSTIRRADIATION EVALUATION OF ZIRCALOY-2 PRTR PRESSURE TUBES. PART III,
by M. C. Fraser. 15 Dec 64, 15p
Contract AT (45-1)-1350

Descriptors: (*Reactor system components, Radiation damage), (*Radiation damage, Test reactors), Zirconium alloys, Pipes.

HW-84544 (app 5) **Field 18K, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
CALCULATED REACTOR PARAMETERS FOR THE HIGH POWER DENSITY CORE IN PRTR,
by R. I. Smith and J. L. Maryott. 3 Dec 64, 9p
Contract AT (45-1)-1350

Descriptors: (*Reactor power density, Test reactors), (*Reactor cores, Reactor power density).

HW-84549 **Field 18G**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS, JANUARY - DECEMBER 1964,
by D. J. Brown. 1964, 23p
Contract AT (45-1)-1350

Descriptors: (*Radioactive wastes, Disposal), (*Underground, Disposal).

HW-84603 **Field 18G**
CFSTI Prices: HC$3.00 MF$0.75
Hanford Atomic Products Operation, Richland, Wash.
RESEARCH AND DEVELOPMENT ACTIVITIES FIXATION OF RADIOACTIVE RESIDUES.
Quarterly progress rept., Oct-Dec 64,
by A. M. Platt. Jan 65, 54p
Contract AT (45-1)-1350

Descriptors: (*Radioactive waste, Processing).

HW-84617 **Field 18-**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
HANFORD FORMAL RESEARCH AND DEVELOPMENT REPORTS, 1964,
by C. G. Stevenson. Jan 65, 35p
Contract AT (45-1)-1350

Descriptors: (*Nuclear physics laboratories, Reports).

IDO-12031 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Idaho Operations Office (AEC), Idaho Falls. Health and Safety Div.
LATENT IMAGE FADING IN PERSONAL NEUTRON MONITORING FILM AT THE NRTS,
by John F. Cusimano. Apr 63, 18p

Descriptors: (*Neutron detectors, Photographic images), (*Photographic images, Ionization trails).

IDO-12040 **Field 18G**
CFSTI Prices: HC$2.00 MF$0.50
Idaho Operations Office (AEC), Idaho Falls. Health and Safety Div.
RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION,
by Joe H. Osloond. 7 Apr 65, 36p

Descriptors: (*Radioactive waste, Disposal), (*Disposal, Radioactive waste).

IDO-12041 **Field 18I, 4B**
CFSTI Prices: HC$2.00 MF$0.50
Weather Bureau, Idaho Falls, Idaho.
AERODYNAMIC EFFECTS OF LARGE REACTOR COMPLEXES UPON ATMOSPHERIC TURBULENCE AND DIFFUSION,
by Norman F. Islitzer. May 65, 34p

Descriptors: (*Buildings, Atmospheric motion), (*Nuclear reactors, Buildings), Turbulence.

IDO-17102 **Field 18I**
CFSTI Prices: HC$2.00 MF$0.50
Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.

HYDRAULIC STUDIES OF SPERT REACTOR CORE COMPONENTS,
by J. P. Koenig. 30 Mar 63, 36p
Contract AT (10-1)-205

Descriptors: (*Reactor cores, Hydraulic systems).

IDO-22047-USGS **Field 18G, 8G, 8H**
CFSTI Prices: HC$7.00 MF$1.50
Geological Survey, Idaho Falls, Idaho.
HYDROLOGY OF SUB-SURFACE WASTE DISPOSAL NATIONAL REACTOR TESTING STATION, IDAHO.
Annual progress rept. for 64,
by D. A. Morris, J. T. Barraclough, G. H. Chase, W. E. Teasdale, and R. G. Jensen. May 65, 304p

Descriptors: (*Radioactive waste, Disposal), (*Hydrology, Radioactive waste).

IS-1159 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Ames Lab., Iowa State Univ. of Science and Tech.
METHOD FOR MEASURING INTERNAL CONVERSION COEFFICIENTS USING A BENT-CRYSTAL GAMMA-RAY MONOCHROMATOR AND A MAGNETIC ELECTRON SPECTROMETER,
by E. N. Hatch, G. W. Eakins, G. C. Nelson, andR. E. McAdams. 13 May 65, 7p CONF-650525-1
Contract W-7405-eng-42
Presented at International Conference on the Internal Conversion Process, Nashville, 10-13 May 1965.

Descriptors: (*Radiation measurement systems, Internal conversion), (*Gamma rays, Internal conversion).

KAPL-M-6198 **Field 18K**
CFSTI Prices: HC$2.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
THE EFFECT OF MESH SIZE ON NUMERICAL CALCULATION OF POWER PEAKING,
by Gerald P. Calame. Aug 64, 29p
Contract W-31-109-eng-52

Descriptors: (*Numerical analysis, Reactor power density).

KAPL-M-6408 **Field 18K, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
MONEY -- A REACTIVITY DATA REDUCTION PROGRAM FOR THE IBM 1620 COMPUTER,
by R. A. Reiter. 11 Jan 65, 11p
Contract W-31-109-eng-52

Descriptors: (*Reactor reactivity, Programming (Computers)), (*Programming (Computers), Reactor reactivity).

KAPL-M-6445 **Field 18K, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
TIM-3--A FLUX WIRE DATA REDUCTION PROGRAM FOR REACTOR PROTOTYPE EVALUATION,
by Sally A. Gazda. 15 Feb 65, 38p
Contract W-31-109-eng-52

Descriptors: (*Reactor kinetics, Programming (Computers)), (*Programming (Computers), Reactor kinetics).

KAPL-3080 **Field 18K**
CFSTI Prices: HC$2.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
CALCULATION OF THE NEUTRON AGE IN HYDROGENOUS MEDIA.

206-320 O - 66 - 22

by P. A. Ombrellaro. Oct 64, 30p
Contract W-31-109-eng-52

Descriptors: (*Neutron age, Neutron transport theory), (*Neutron flux, Fourier analysis).

KY-481 Field 18J, 11F, 7B, 14B
CFSTI Prices: HC$2.00 MF$0.50
Paducah Gaseous Diffusion Plant, Ky.
PRUITY DETERMINATION OF A URANIUM METAL STANDARD,
by B. H. Whiteaker, J. C. Gillespie, and P. E. Dill. 1 Mar 65, 29p
Contract W-7405-eng-26

Descriptors: (*Uranium, Standards).

LA-DC-6578 Field 18K, 20M
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
NONLINEAR FUNCTIONAL EQUATIONS AND THE STRUCTURE OF SOLUTIONS OF A STEADY STATE HEAT-FLOW PROBLEM,
by George H. Pimbley, Jr. 1964, 41p
Contract W-7405-eng-36

Descriptors: (*Heat transfer, Reactor kinetics), (*Reactor kinetics, Boundary value problems).

LA-DC-6579 Field 18K
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
BURST BEHAVIOR OF A URANIUM-MOLYBDENUM GODIVA-TYPE REACTOR,
by T. F. Wimett, R. H. White, and R. A. Pederson. 1963, 10p
Contract W-7405-eng-36

Descriptors: (*Critical assemblies, Reactor cores), (*Reactor cores, Reactor kinetics).

LA-DC-6645 Field 18F
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
METHODS USED IN THE UNITED STATES HOT LABORATORIES FOR TRANSFERRING MATERIALS THROUGH GAMMA AND ALPHA-GAMMA BARRIERS,
by John W. Schulte. 1964, 13p
Contract W-7405-eng-36

Descriptors: (*Reactor materials, Reactor operation), (*Reactor safety systems, Reactor materials).

LA-DC-6845 Field 18I, 21F
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
MEASUREMENT OF THE POWER-TO-CORE TEMPERATURE TRANSFER FUNCTION OF KIWI-B-4E,
by J. Douglas Balcomb. 1964, 15p CONF-650610-19
Contract W-7405-eng-36
Presented at American Institute of Aeronautics and Astronautics, Propulsion Joint Specialists Conference, Colorado Springs.

Descriptors: (*Rocket propulsion, Nuclear propulsion), (*Nuclear propulsion, Rocket propulsion), (*Reactor cores, Temperature), (*Reactor power density, Temperature).

Identifiers: KIWI.

LA-DC-6889 Field 18M, 18L
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE ROLE OF NONDESTRUCTIVE TESTING IN THE LOS ALAMOS REACTOR PROGRAM,
by Gerold H. Tenney. 1964, 31p CONF-650509-2
Contract W-7405-eng-36
Prepared for presentation to IAEA Symposium on Nondestructive Testing in Nuclear Technology, Bucharest.

Descriptors: (*Nuclear reactors, Non-destructive testing).

LA-DC-6965 Field 18J
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
A NEW TECHNIQUE FOR TESTING MOLTEN PLUTONIUM CONTAINER MATERIALS AT HIGH TEMPERATURE,
by R. L. Andelin, A. R. Hawkins, and N. G. Wilson, 1965, 5p CONF-650602-11
Contract W-7405-eng-36
Presented at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn. 21-24 Jun 1965.

Descriptors: (*Reactor fuel cladding, Test methods), (*High-temperature research, Reactor materials).

LA-DC-6968 Field 18I, 21F
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
LOS ALAMOS COUPLED REACTOR EXPERIMENTS: TECHNIQUES,
by Herbert H. Helmick, Curtis G. Chezem and Robert L. Seale. 1965, 4p CONF-650602-14
Contract W-7405-eng-36
Prepared for presentation at American Nuclear Society meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Kiwi).

LA-DC-6973 Field 18D
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
DETECTION OF PLUTONIUM PENETRATION THROUGH CONTAINERS AT HIGH TEMPERATURES,
by Bill M. Moore, Dale M. Holm, H. Ruess and R. L. Andelin. 1965, 4p CONF-650602-15
Contract W-7405-eng-36
Presented at American Nuclear Society annual meeting (11th), Gatlinburg, Tenn., 21-24 Jun 1965.

Descriptors: (*Plutonium, Penetration).

LA-DC-7003 Field 18J, 18I
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE BEHAVIOR OF COATED PARTICLE FUELS IN A LARGE NUCLEAR TRANSIENT (KIWI TNT),
by W. U. Geer, C. G. Hoffman and J. F. Kerrisk. 1964, 4p CONF-650602-13
Contract W-7405-eng-36
Presented at American Nuclear Society annual meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Reactor fuel elements, Coatings), (*Reactor accidents, Reactor fuel elements).

LA-DC-7004 Field 18I
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
APPLICATION OF MINIATURE INTRINSIC THERMOCOUPLES FOR REACTOR TRANSIENT DIAGNOSTICS,
by Roderick G. Morrison. 1964, 3p CONF-650602-16
Contract W-7405-eng-36
Presented at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Thermocouples, Reactor system components), (*Reactor system components, Thermocouples).

LA-DC-7007 Field 18K
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
RECENT DEVELOPMENT IN COMPUTERS AND THEIR IMPLICATIONS FOR REACTOR CALCULATIONS,
by W. J. Worlton and E. A. Voorhees. 1964, 30p CONF-650501-7
Contract W-7405-eng-36
Presented at the Application of Computing Methods to Reactor Problems, Argonne, Ill.

Descriptors: (*Programming (Computers), Nuclear physics), (*Nuclear physics, Programming (Computers).

LA-DC-7043 Field 18A, 20I
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE FAST PLASMA FROM A COAXIAL GUN,
by John Marshall and Ivars Henins. 1964, 26p CONF-650911-9
Contract W-7405-eng-36
Presented at Conference on Plasma Physics and Controlled Nuclear Fusion Research (2nd), Abingdon, Berks, Eng.

Descriptors: (*Plasma physics, Acceleration), (*Nuclear particles, Thermonuclear reactions).

LA-DC-7111 Field 18C, 20H
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
PRODUCTION OF HEAVY NUCLIDES BY MULTIPLE NEUTRON CAPTURE IN NUCLEAR EXPLOSIONS,
by George I. Bell. 1965, 5p CONF-650706-18
Contract W-7405-eng-36
Presented at International Conference on the Study of Nuclear Structure with Neutron, Antwerp.

Descriptors: (*Nuclei, Production), (*Neutron capture, Nuclei).

LA-DC-7139 Field 18F
CFSTI Prices: HC$3.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
NEUTRONIC ISOLATION CHARACTERISTICS OF CONCRETE, LEAD, WOOD, POLYETHYLENE AND BERYLLIUM.
Master's thesis,
by Thomas C. McCreless, Jr. 1965, 53p
Contract W-7405-eng-36
Submitted to University of Maryland.

Descriptors: (*Shielding, Materials).

LA-DC-7206 Field 18I
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
STATUS REPORT ON THEORY AND EXPERIMENTS ON HEAT PIPES AT LOS ALAMOS,
by T. P. Cotter, J. Deverall, G. F. Erickson, G. M. Grover and J. E. Kemme. 1965, 12p CONF-650908-1
Contract W-7405-eng-36

Presented at International Conference on Thermionic Electrical Power Generation, London.

Descriptors: (*Reactor system components, Thermal conductivity), (*Thermionic converters, Power reactors).

MIT-2098-155 **Field 18D, 14D, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge. Lab for Nuclear Science.
GUIDED FLYING SPOT SYSTEMS FOR SPARK CHAMBERS,
by Martin Deutsch. 20 Jun 65, 8p CONF-650510-6
Contract AT (30-1)-2098
Presented at Purdue Conference on Instrumentation for High Energy Physics, Lafayette, Ind.

Descriptors: (*Scintillation counters, Photographic images), (*Photographic analysis, Programming (Computers).

MLM-1250 **Field 18B, 7E**
CFSTI Prices: HC$2.00 MF$0.50
Mound Lab., Miamisburg, Ohio.
MOUND LABORATORY PROGRESS REPORT FOR MARCH 1965,
by J. F. Eichelberger, G. R. Grove, and L. V. Jones. 31 Mar 65, 35p
Contract AT (33-1)-GEN-53

Descriptors: (*Radioactive isotopes, Isotope separation), (*Radiochemistry, Organic materials).

MND-2706-14 **Field 18J**
CFSTI Prices: HC$7.51 MF$2.00
Martin Co., Baltimore, Md. Nuclear Div.
TUBULAR CORE DEVELOPMENT PROGRAM. PM CORE 3 DESIGN.
Status rept.,
by W. Brittain, T. Christenbury, C. George, J. Pollard, and F. Russo. Jan 65, 451p
Contract AT (30-1)-2706

Descriptors: (*Reactor cores, Design).

MND-3169-16 **Field 18N, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Martin Co., Baltimore, Md. Nuclear Div.
SPECIFICATION FOR PLASMA ARC TESTS OF SNAP-19 FUEL CAPSULES,
by W. B. Weber. 1963, 24p
Contract AT (30-1)-3169

Descriptors: (*Nuclear power plants, Spacecraft), (*Reactor fuel elements, Test methods).

NAA-SR-MEMO-11041 **Field 18L, 18E**
CFSTI Prices: HC$2.00 MF$0.50
Atomics International, Canoga Park, Calif.
LSGR FAST SHUTDOWN PROCEDURE,
by F. J. Halfen. 12 Feb 65, 45p
Contract AT-11-1-GEN-8

Descriptors: (*Reactor shutdown, Nuclear power plants), (*Nuclear power plants, Reactor shutdown).

NAA-SR-MEMO-11046 **Field 18L, 18E**
CFSTI Prices: HC$1.00 MF$0.50
Atomics International, Canoga Park, Calif.
HNPF ALTERNATE CORE MODIFICATION STUDIES.
by R. E. Aronstein, A. V. Campise, P. Speigler, J. Vitti, and D. Casey. 18 Feb 65, 23p
Contract AT-11-1-GEN-8

Descriptors: (*Reactor cores, Fast reactors), (*Reactor feasibility studies, Reactor cores).

NMI-1266 **Field 18J, 20B**
CFSTI Prices: HC$4.00 MF$0.75
Nuclear Metals, West Concord, Mass.
FUNDAMENTALS OF SINGLE-CRYSTAL DEFORMATION IN ZONE-REFINED BERYLLIUM.
Final rept. 1 Jul 61-30 Jun 65,
by D. F. Kaufman, J. J. Pickett and L. R. Aronin. 30 Jun 65, 111p
Contract AT (30-1)-2784

Descriptors: (*Single crystals, Deformation), (*Beryllium, Mechanical properties).

NRL-MEMO-1596 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Research Lab., Washington, D. C.
IN-REACTOR FATIGUE TESTS OF A302-B STEEL REPRESENTING THE ELK RIVER REACTOR PRESSURE VESSEL,
by J. R. Hawthorne and L. E. Steele. 15 Feb 65, 17p
Contract AT (11-1)-1369

Descriptors: (*Reactor system components, Pressure vessels), (*Pressure vessels, Fatigue (Mechanics)).

NUMEC-2389-5 **Field 18J, 13H**
CFSTI Prices: HC$2.00 MF$0.50
Nuclear Materials and Equipment Corp., Apollo, Pa. Plutonium Lab.
MORPHOLOGICAL CHARACTERISTICS OF COPRECIPITATED (U, PU)p 2 POWDERS BY ELECTRON MICROSCOPY,
by J. Roth and E. K. Haltoman. 1962, 41p
Contract AT (30-1)-2389

Descriptors: (*Powder metallurgy, Electron microscopy), (*Electron microscopy, Powder metallurgy).

NYO-3274-2 **Field 18B**
CFSTI Prices: HC$2.00 MF$0.50
New York State Agricultural Experiment Station, Geneva.
BIOCHEMISTRY AND PHYSIOLOGY OF IRRADIATED FRUITS AND VEGETABLES.
Annual progress rept. Sep 4, 64-Sep 3, 65,
by Louis M. Massey, Jr. 31 May 65, 42p
Contract AT (30-1)-3274

Descriptors: (*Irradiated foods, Gamma rays), (*Gamma rays, Irradiated foods).

NYO-3289-1 **Field 18L**
CFSTI Prices: HC$3.00 MF$0.75
Nuclear Utility Services, Inc., Washington, D.C.
COMPARATIVE EVALUATION OF SINGLE AND DUAL WATER-COOLED REACTOR POWER PLANTS.
31 Jan 65, 95p
Contract AT (30-1)-3289

Descriptors: (*Nuclear power plants, Economics).

ORNL-P-1374 **Field 18A, 20I**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
ENERGETIC NEUTRAL INJECTION INTO AN ELECTRONCYCLOTRON PLASMA,
by W. B. Ard, R. A. Dandl, A. C. England, G. M. Haas, and N. H. Lazar. 1965, 29p CONF-650911-2
Contract W-7405-eng-26
Presented at Conference on Plasma Physics and Controlled Nuclear Fusion Research (2nd), Abingdon, Berks, Eng.

Descriptors: (*Plasma medium, Cyclotrons), (*Thermonuclear reactions, Control).

ORNL-P-1244 **Field 18A, 20I**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
ENGINEERING ASPECTS OF THE PRODUCTION OF EXCITED STATE H PLUS 2 FOR LORENTZ DISSOCIATION IN DCX-1,
by R. S. Edwards. 1963, 10p CONF-650512-3
Contract W-7405-eng-26
Presented at Symposium on Engineering Problems of Controlled Thermonuclear Research, Livermore, Calif.

Descriptors: (*Thermonuclear reactions, Plasma physics), (*Plasma physics, Thermonuclear reactions).

ORNL-P-1248 **Field 18K, 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
SOME CONVERSION COEFFICIENTS WHICH SHOULD BE MEASURED,
by Agda Arina. 1965, 5p CONF-650525-2
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Internal Conversion Process, Nashville., 10-13 May 1965.

Descriptors: (*Conversion ratio, Internal conversion).

ORNL-P-1313 **Field 18I, 18G**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
AEROSOL PHYSICS OF RADIOACTIVE PARTICLES,
by B. R. Fish and R. L. Walker. 1965, 18p CONF-650497-4
Contract W-7405-eng-26
Prepared for presentation at International Symposium on Fission Product Release and Transport under Accident Conditions, Oak Ridge, Tenn.

Descriptors: (*Aerosols, Fission product activity), (*Fission product activity, Reactor accidents).

ORNL-P-1337 **Field 18A, 20I**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
SEVERE MICROINSTABILITY-DRIVEN LOSSES IN AN ENERGETIC PLASMA,
by J. L. Dunlap, H. Postma, and G. B. Haste. 1965, 16p CONF-650911-8
Contract W-7405-eng-26
Prepared for presentation at Conference on Plasma Physics and Controller Nuclear Fusion Research, (9th) Abingdon, Berks, Eng.

Descriptors: (*Plasma physics, Thermonuclear reactions), (*Thermonuclear reactions, Plasma physics).

ORNL-P-1431 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
MATERIALS CONTROL IN THE FABRICATION OF ENRICHED URANIUM FUELS,
by Roy G. Cardwell, Jr. 1965, 23p CONF-650803-2
Contract W-7405-eng-26
Presented at Iaea Symposium on Nuclear Materials Management, Vienna.

Descriptors: (*Reactor fuel enrichment, Uranium), (*Reactor fuel processing, Quality control).

ORNL-P-299 **Field 18J, 20G**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
NUMERICAL SOLUTIONS OF THE ONE-DIMENSIONAL NUCLEON-MESON CASCADE EQUATIONS,

by R. G. Alsmiller, Jr., J. E. Murphy and J. Barish. 1964, 14p
Contract W-7405-eng-26

Descriptors: (*Particle accelerator components, Shielding), (*Meson reactions, Nuclear reactions).

ORNL-P-748 **Field 18K, 12A**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
ONE-VELOCITY MONTE CARLO CALCULATIONS OF URANIUM METAL CRITICAL GEOMETRIES,
by J. T. Mihalczo. 13 Nov 64, 7p
Contract W-7405-eng-26

Descriptors: (*Critical assemblies, Geometry), (*Monte Carlo method, Geometry).

ORNL-P-899 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
MOLTEN FLUORIDES AS NUCLEAR REACTOR FUELS,
by F. F. Blankenship, H. F. McDuffie, and R. E. Thoma. 1965, 5p CONF-650502-2
Contract W-7405-eng-36
Prepared for presentation at Electrochemical Society, San Francisco.

Descriptors: (*Reactor fuels, Fluorides), (*Fluorides, Reactor fuels).

ORNL-TM-1026 **Field 18J**
CFSTI Prices: HC$3.00 MF$0.75
Oak Ridge National Lab., Tenn.
EGCR CONTROL ROD DRIVE ENVIRONMENTAL TEST,
by W. F. Ferguson. Jun 65, 58p
Contract W-7405-eng-26

Descriptors: (*Control rods, Drives), (*Gas-cooled reactors, Control rods).

ORNL-TM-1048 **Field 18I**
CFSTI Prices: HC$4.00 MF$0.75
Oak Ridge National Lab., Tenn.
GCR-ORR LOOP 2 DESIGN,
by J. Zasler, P. A. Gnadt, W. R. Huntley, T. S. Kress, and H. C. Roller. Jun 65, 119p
Contract W-7405-eng-26

Descriptors: (*Gas-cooled reactors, Design), (*Research reactors, Design).

ORNL-TM-1116 **Field 18J**
CFSTI Prices: HC$4.00 MF$0.75
Oak Ridge National Lab., Tenn.
COATED-PARTICLE FUELS DEVELOPMENT AT OAK RIDGE NATIONAL LABORATORY FOR PERIOD NOVEMBER 15, 1964 TO MAY 15, 1965,
by W. D. Harms and J. H. Coobs. May 65, 102p
Contract W-7405-eng-26

Descriptors: (*Reactor fuels, Refractory coatings), (*Refractory coatings, Carbon).

ORNL-TM-1145 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
THE TECHNICAL AND ECONOMIC CHARACTERISTICS OF THORIUM REACTORS,
by M. W. Rosenthal, H. F. Bauman, L. L. Bennett, R. S. Carlsmith, and D. R. Vondy. 3 Jun 65, 28p CONF-650615-4
Contract W-7405-eng-26
Prepared for presentation at IAEA Panel on Utilization of Thorium in Power Reactors, Vienna., 14-18 Jun 1965.

Descriptors: (*Reactor fuels, Thorium), (*Thorium, Reactor fuels).

ORNL-3642 **Field 18L, 18E**
CFSTI Prices: HC$3.00 MF$1.25
Oak Ridge National Lab., Tenn.
GAS-COOLED FAST REACTOR CONCEPTS.
Sep 64, 235p
Contract W-7405-eng-26

Descriptors: (*Gas-cooled reactors, Nuclear power plants), (*Nuclear power plants, Fast reactors).

ORO-586 (vol. 1) (suppl. 1) **Field 18F**
CFSTI Prices: HC$5.00 MF$1.25
Oak Ridge Operations Office (AEC), Tenn.
REVISIONS TO EXPERIMENTAL GAS COOLED REACTOR FINAL HAZARDS SUMMARY REPORT, OCTOBER 10, 1962. VOLUME I. DESCRIPTION AND HAZARDS EVALUATION.
Apr 65, 366p

Descriptors: (*Reactor hazards, Gas-cooled reactors), (*Gas-cooled reactors, Reactor hazards).

Patent 3,216,174 **Field 18G**
APPARATUS FOR CANNING NUCLEAR REACTOR FUEL ELEMENTS.
Patent assigned to AEC,
by David Nicoll and Jackson L. Hedgecock. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Reactor fuel elements, Packaging), (*Radioactive waste, Disposal), Machines, Containers, Patents.

The apparatus is for packaging 'spent' fuel elements removed from a nuclear reactor. The apparatus is associated with a reactor facility and includes charging and canning machines. The apparatus may also be used for handling and canning control rods and radiation samples.

Patent 3,218,123 **Field 18G**
RECOVERY OF STRONTIUM VALUES FROM SULFATE-CONTAINING WASTE SOLUTIONS.
Patent assigned to AEC,
by Wallace Davis, Jr. and William C. Yee. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Radioactive waste, Processing), (*Strontium, Separation), Reactor fuel processing, Sulfates, Solutions, Nitric acid, Chemical precipitation, Iron compounds, Nitrates, Patents.

A method is described for recovering strontium values from a nitric acid fission product solution containing the same, together with sulfate ions and ions of at least one metal in the group consisting of iron, aluminum and chromium which comprises precipitating said strontium values as strontium nitrate at a nitric acid concentration of at least about 18 molar and separating the resulting precipitate from the remaining solution, the improvement which comprises adding a sufficient amoent of ferric ions to said solution to provide a stoichiometric excess for formation of ferric sulfate, increasing the nitric acid concentration of the resulting solution to about 55 to 60 weight percent whereby ferric sulfate is precipitated and separating the resulting precipitate from the remaining solution prior to precipitating said strontium nitrate.

Patent 3,218,160 **Field 18G, 18J**
REGENERATION OF NUCLEAR FUEL.
Patent assigned to AEC,
by James B. Knighton, Harold M. Feder and Robert K. Steunenberg. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Reactor fuel processing, Separation), (*Fission products, Separation), Uranium, Plutonium, Magnesium compounds, Potassium compounds, Chlorides, Magnesium alloys, Zinc alloys, Cadmium alloys, Vaporization, Patents.

Identifiers: Fused salts.

The nuclear fuel to be processes is introduced into a molten salt mixture of 50 mole percent of magnesium chloride, 30 mole percent of potassium chloride and 20 mole percent of sodium chloride and of molten zincmagnesium-cadmium alloy consisting of from 83 to 97 atom percent of cadmium, from 5 to 24 atom percent of magnesium and from 3 to 18 atom percent of zinc. An alloy phase containing uranium and plutonium values is separated from a salt phase containing fission-product values.

PB-168 792 **Field 18H, 6H, 6R**
CFSTI Prices: HC$1.00 MF$0.50
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PROFILE OF LONG-LIVED RADIONUCLIDES IN MILK, 1923 to 1936, 1946 to 1961,
by G. K. Murthy and J. E. Campbell. May 64, 14p
PHS Pub-999-FP-2
Rept. on Environmental Health Series. Food Protection.

Descriptors: (*Radioactive isotopes, Milk), (*Milk, Radiological contamination), Public health, Strontium, Cesium, Rubidium, Sampling.

The historical increase in the concentration of strontium90 and cesium-137 in samples of powdered milk produced during the years 1923 to 1936 and 1946 to 1961 is presented. No strontium-90 and cesium-137 activities were observed in samples produced prior to 1946, and any significant activity above background levels has been observed only since 1948. The rates of increase in strontium90 and cesium-137 activities were similar while the rate of decrease of cesium-137, after the cessation of weapons tests in 1958, has been rapid compared with that of strontium-90. Comparison of the yearly strontium-90 in samples from Washington with those observed for powdered milk samples from Wisconsin and New York shows close agreement in spite of geographic differences and variations in feeding practices. The profile of strontium-90 in powdered milk was compared with that in liquid milk samples obtained by the Raw Milk Sampling Network of the Public Health Service. The possibility of using data from samples of milk produced prior to 1954 to compute human exposure to radioactivity is suggested. The yearly average rubidium-87 concentrations in milk showed very little change with time because of the similarity of its chemical and metabolic behavior to that of potassium. (Author)

PPAD-2137-548 **Field 18D, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Princeton Univ., N. J. Plasma Physics Lab.
OFF-LINE GLOBAL APPROACH TO PATTERN RECOGNITION FOR BUBBLE CHAMBER PICTURES,
by M. J. Bazin and J. W. Benoit. 19 May 65, 12p CONF-650510-11
Contract AT (30-1)-2137
Prepared for presentation at Purdue Conference on Instrumentation for High Energy Physics, Lafayette, Ind.

Descriptors: (*Bubble chambers, Photographs), (*Pattern recognition, Photographs).

RFP-502 **Field 18J, 7B**
CFSTI Prices: HC$4.00 MF$0.75
Rocky Flats Div., Dow Chemical Co., Denver, Colo.
MEASUREMENTS INVOLVED IN SHIPPING PLUTONIUM OXIDE,

by J. T. Byrne, C. E. Caldwell, R. L. Delnay J. D. Moseley and F. L. Oetting. 10 Aug 65, 88p
Contract AT (29-1)-1106

Descriptors: (*Reactor materials, Transportation), (*Plutonium compounds, Oxides).

RFP-508 **Field 18J, 7B, 6R, 18I**
CFSTI Prices: HC$2.00 MF$0.50
Rocky Flats Div., Dow Chemical Co., Golden, Colo.
HANDLING AND MEASUREMENT OF PLUTONIUM SHIPMENTS, IAEA SYMPOSIUM ON NUCLEAR MATERIALS MANAGEMENT, VIENNA,
by J. T. Byrne. 1965, 32p CONF-650803-5
Contract AT (29-1)-1106

Descriptors: (*Reactor materials, Transportation), (*Plutonium, Handling).

RL-NRD-105 **Field 18L, 18I**
CFSTI Prices: HC$4.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
CONTROL ASPECTS OF A LARGE, DUAL-PURPOSE NUCLEAR REACTOR PLANT,
by D. W. Leiby. Dec 64, 35p
Contract AT (45-1)-1350

Descriptors: (*Power reactors, Reactor control), (*Reactor control, Power reactors).

RL-REA-592 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
PERFORMANCE OF SELECTED INHIBITORS IN REACTOR COOLANT BACKUP SERVICE,
by L. D. Gustafson. 15 Feb 65, 11p
Contract AT (45-1)-1350

Descriptors: (*Reactor materials, Corrosion inhibition), (*Reactor coolants, Additives).

RL-SA-17A **Field 18I, 18M**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
OPERATIONAL PROCEDURES IN DEACTIVATION OF THE HANFORD PRODUCTION REACTORS,
by Sterling L. Nelson. 8 Jan 65, 5p
Contract AT (45-1)-1350

Descriptors: (*Production reactors, Reactor shutdown), (*Reactor shutdown, Graphite moderated reactors).

RL-SA-42 **Field 18I, 18L**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
APPLICATION OF NPR TECHNOLOGY TO THE NATIONAL NUCLEAR PROGRAM.
by H. R. Kosmata. June 65, 18p CONF-650602-3
Contract AT (45-1-1350
Prepared for Presentation at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Production reactors, Power reactors), (*Power reactors, Production reactors).

RL-SEP-46 **Field 18G**
CFSTI Prices: HC$3.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
THE GAMMA ANALYTICAL SYSTEM AT REDOX,
by W. H. Zimmer. Sep 64, 51p
Contract AT (45-1)-1350

Descriptors: (*Radioactive waste, Analysis).

RL-SEP-65 **Field 18G**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
CHEMICAL PROCESSING DEPARTMENT HAZARDS EVALUATION IN-TANK WASTE SOLIDIFICATION PROJECT CAC-965,
by G. E. Backman, E. M. Johnston, H. C. Rathvon, L. W. Roddy, and M. F. Wiitala. 24 Nov 64, 27p
Contract AT (45-1)-1350

Descriptors: (*Radioactive waste, Disposal), (*Radiation hazards, Radioactive waste).

RPI-328-29 **Field 18J, 18K**
CFSTI Prices: HC$1.00 MF$0.50
Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Nuclear Engineering and Science.
SPATIALLY DEPENDENT ASYMPTOTIC SPECTRA MEASUREMENTS IN WATER AND POLYETHYLENE,
by E. R. Gaerttner, R. R. Fullwood, and J. H. Menzel. 1964, 23p CONF-650504-2
Contract AT (30-3)-328
Prepared for presentation at IAEA Symposium on Pulsed Neutron Methods, Karlsruhe, Germany.

Descriptors: (*Neutron spectrum, Reactor moderators), (*Water, Polyethylene plastics).

RPI-328-31 **Field 18J, 18K**
CFSTI Prices: HC$2.00 MF$0.50
Rennssalaer Polytechnic Inst., Troy, N. Y. Dept. of Nuclear Engineering and Science.
ANALYSIS OF PULSED NEUTRON EXPERIMENTS IN MODERATING ASSEMBLIES,
by P. B. Daitch, R. R. Lee, and R. L. Hobson. 1965, 34p CONF-650413-3
Contract AT (30-3)-328
Prepared for presentation at Symposium on Neutron Dynamics and Control, Tucson, Ariz.

Descriptors: (*Neutron spectrum, Reactor moderators), (*Reactor moderators, Neutron transport theory).

SAN-409-24 **Field 18N, 20M**
CFSTI Prices: HC$1.00 MF$0.50
Geoscience Ltd., La Jolla, Calif.
HIGH ACCELERATION FIELD HEAT TRANSFER FOR AUXILIARY SPACE NUCLEAR POWER SYSTEMS.
Quarterly technical rept. 1 Mar-31 May 65,
by H. F. Poppendiek, N. D. Greene, C. M. Sabin, and D. J. Connelly. 1965, 17p
Contract AT (04-3)-409

Descriptors: (*Auxiliary power plants, Heat transfer), (*Heat transfer, Auxiliary power plants).

SC-DC-1544 **Field 18J**
CFSTI Prices: HC$1.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
ENERGY TRANSFER BY NEUTRONS TO CERTAIN MATERIALS,
by W. H. Buckalew. Jun 65, 8p (CONF-656707-1)
Contract AT (29-1)-789
Prepared for presentation at IEEE Annual Conference on Nuclear and Space Radiation Effects, Ann Arbor, Mich.

Descriptors: (*Radiation damage, Neutrons), (*Neutron absorption, Energy).

SC-DC-65-1332 **Field 18J**
CFSTI Prices: HC$3.00 MF$0.75
Sandia Corp., Alberquerque, N. Mex.
MODULATOR MATERIALS STUDY PROGRAM.
Final rept.,
by Richmond B. McQuistan. Jul 63, 71p
Contract AT (29-1)-789
Prepared in cooperation with Honeywell, Inc., Minneapolis, Minn. Aeronautical Div.

Descriptors: (*Reactor materials, Modulators).

SWRI-1228-57 **Field 18M, 11F, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
CYCLIC PRESSURE TESTS OF LARGE PRESSURE VESSELS.
Progress rept. no. 13, 18 Jan-18 Mar 65,
by Andrew G. Pickett. 18 Mar 65, 11p SWRI-1228-58, SWRI-1228-59
Contract AT (11-1)-1228

Descriptors: (*Pressure vessels, Test methods), (*Steel, Pressure vessels).

SWRI-1228-64 **Field 18M, 18K, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
EVALUATION OF THE SERVICEABILITY OF THE ELK RIVER REACTOR PRESSURE VESSEL.
Progress rept. no. 11, 1 Mar-30 Apr 65,
by Jose McDonald, Jr., Elwood B. Norris and Kenneth K. Speirs. 30 Apr 65, 21p
Contract AT (11-1)-1228

Descriptors: (*Pressure vessels, Non-destructive testing), Metallurgy.

TEI-857 **Field 18C**
CFSTI Prices: HC$4.00 MF$1.00
Geological Survey, Washington, D. C.
POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES. PRINCIPLES,
by Arthur M. Piper and Frank W. Stead. Mar 65, 132p

Descriptors: (*Nuclear explosions, Water supplies), (*Water supplies, Nuclear explosions), Nuclear industrial applications.

TID-21653 **Field 18I**
CFSTI Prices: HC$3.00 MF$0.75
Consumers Public Power District, Hallam, Neb.
HALLAM NUCLEAR POWER FACILITY MONTHLY OPERATING REPORT.
Rept. for Dec 64.
1964, 67p Rept. no. 29
Contract AT (11-1)-513

Descriptors: (*Sodium graphite reactors, Reactor operation), (*Reactor operation, Sodium graphite reactors).

TID-21851 **Field 18K**
CFSTI Prices: HC$3.00 MF$0.75
Virginia Polytechnic Inst., Blacksburg. Dept. of Physics.
THE MEASUREMENT OF NEUTRON DIFFUSION PARAMETERS IN HEAVY AND LIGHT WATER CONCEN- TRATIONS BY THE PULSED NEUTRON TECHNIQUE.
Doctoral thesis,
by Harold Gwen Jones. Jun 65, 59p
Contract AT (40-1)-2686

Descriptors: (*Neutron transport theory, Measurement), (*Heavy water reactors, Light water reactors).

TID-21860 **Field 18K**
CFSTI Prices: HC$7.00 MF$2.00
Florida Univ., Gainesville. Dept. of Nuclear Engineering.
MEASUREMENT OF REACTOR SHUTDOWN MARGIN BY CORRELATION TECHNIQUES.
Final rept.,
by Robert E. Uhrig. May 65, 392p
Contract AT (40-1)-3067

Descriptors: (*Reactor shutdown, Correlation techniques).

TID-21892 **Field 18H, 7E**
CFSTI Prices: HC$3.00 MF$0.75
Texas Instruments Inc., Dallas. Science Services Div.
MEASUREMENT OF RADIOACTIVE FALLOUT BY FIELD TOTAL ABSORPTION GAMMA RAY SPECTROSCOPY.
Rept. no. 1.
30 Sep 63, 98p
Contract AT (40-1)-3147

Descriptors: (*Radioactive fallout, Gamma-ray spectroscopy), (*Gamma-ray spectroscopy, Radioactive fallout).

TID-21893 **Field 18L, 18E**
CFSTI Prices: HC$3.00 MF$0.75
Consumers Public Power District, Hallam, Nebr.
HALLAM NUCLEAR POWER FACILITY.
Monthly operating rept. no. 31.
Feb 65, 79p
Contract AT (11-1)-513

Descriptors: (*Nuclear power plants, Power reactors), (*Power reactors, Nuclear power plants).

TID-21953 **Field 18L, 18E**
CFSTI Prices: HC$5.00 MF$1.25
Argonne National Lab., Ill.
FLOW MODEL STUDY OF THE EBR-II.
Final rept., 15 Jul 58-2 Dec 60,
by Daniel T. Rymsa and George Peter Wachtell.
1960, 178p F-A2201
Contract W-31-109-eng-38
Subcontracted to Franklin Inst., Philadelphia, Pa. Labs. for Research and Development, Contract 31-109-38-974.

Descriptors: (*Breeder reactors, Fluid flow), (*Fluid flow, Models (Simulations)).

TID-21970 **Field 18E, 18L**
CFSTI Prices: HC$1.00 MF$0.50
Societa Elettronucleare Nazionale, Rome (Italy).
GARIGLIANO NUCLEAR POWER PLANT WORK PROGRESS IN 4TH QUARTER OF 1964.
31 Dec 64, 7p

Descriptors: (*Nuclear power plants, Italy).

TID-22050 **Field 18A, 20I**
CFSTI Prices: HC$1.00 MF$0.50
Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
NONLINEAR MODE INTERACTIONS IN UNIVERSAL PLASMA INSTABILITIES,
by Herbert Lashinsky. May 65, 10p BN-399
Contract AT (30-1)-2464; Grant AF-AFOSR-141-65

Descriptors: (*Plasma oscillations, Stability), (*Plasma sheath, Damping).

TIM-792 **Field 18F, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Aircraft Nuclear Engine Lab.
USE OF DSN CODE FOR NEUTRON SHIELDING CALCULATIONS,
by A. R. Larson. 27 Dec 63, 8p
Contract AT (11-1)-229

Descriptors: (*Reactor shielding calculations, Neutron flux), (*Programming (Computers), Reactor shielding calculations).

TIM-799 **Field 18N, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Aircraft Nuclear Engine Lab.
SCARF -- A NEUTRON SCATTERING CODE FOR SNAP TYPE RADIATORS,
by W. Granter. 23 Jan 64, 23p
Contract AT (30-1)-2789

Descriptors: (*Nuclear power plants, Spacecraft), (*Neutron scattering, Programming (Computers)).

TIM-829 **Field 18K, 9B**
CFSTI Prices: HC$3.00 MF$0.75
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Aircraft Nuclear Engine Lab.
STERNO -- A TWO DIMENSIONAL, GAMMA-HEATING CODE,
by C. E. Keller. 14 Oct 64, 62p
Contract AT (11-1)-229

Descriptors: (*Photonuclear reaction, Heatng), (*Programming (Computers), Reactor kinetics).

TIM-909 **Field 18I, 13K**
CFSTI Prices: HC$3.00 MF$0.75
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
SUMMARY OF SHAFT FACE SEAL DEVELOPMENT PROGRAM,
by D. V. Manfredi. 30 Jun 65, 78p
Contract AT (30-1)-2789

Descriptors: (*Liquid metal cooled reactors, Liquid metal pumps), (*Liquid metal pumps, Seals).

UCRL-11454 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
A CONCRETE LOW-BACKGROUND COUNTING ENCLOSURE,
by Harold A. Wollenberg and Alan R. Smith. 15 Jun 64, 21p
Contract W-7405-eng-48

Descriptors: (*Gamma counters, Structures), (*Concrete, Structures).

UCRL-11958 **Field 18H, 9A**
CFSTI Prices: HC$7.00 MF$1.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
ALPHA PARTICLE BOMBARDMENT OF Si AND GaAs DIODES ENERGY CONVERSION AND RADIATION DAMAGE.
Doctoral thesis,
by Lawrence D. Posey. Jun 65, 307p
Contract W-7403-eng-48

Descriptors: (*Radiation damage, Diodes (Semiconductor)), (*Alpha bombardment, Energy conversion).

UCRL-12013 **Field 18K**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California. Livermore.
PULSED NEUTRON MEASUREMENTS ON SOLIDMODERATED, ENRICHED-URANIUM SUBCRITICAL ASSEMBLIES,
by J. R. Morton, III and E. Goldberg. Jul 64, 16p
Contract W-7405-eng-48

Descriptors: (*Enriched fuel reactors, Neutron transport theory), (*Neutron transport theory, Subcritical assemblies).

UCRL-14120 **Field 18I, 20H**
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
ABSTRACTS OF PAPERS FROM SYMPOSIUM ON ENGINEERING PROBLEMS OF CONTROLLED THERMONUCLEAR RESEARCH, MAY 4-7, 1965.
1965, 50p CONF-650512
Contract W-7405-eng-48

Descriptors: (*Thermonuclear reactions, Control).

UCRL-14131 **Field 18A**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab. Univ. of California, Livermore.
THEORETICAL STUDIES OF ELECTRON INJECTION AND E-LAYER BUILD-UP IN ASTRON,
by John Killeen, V. Kelvin Neil and Warren Heckrotte. 7 Jun 65, 25p CONF-650911-7
Contract W-7405-eng-48
Prepared for Presentation at Conference on Plasma Physics and Controlled Nuclear Fusion Research, (2nd.) Abingdon, Berks, Eng.

Descriptors: (*Thermonuclear reactions, Electron beams), (*Electron beams, Focusing).

Identifiers: Astron.

UCRL-16149 **Field 18D, 7E**
CFSTI Prices: HC$3.00 MF$0.75
Lawrence Radiation Lab., Univ. of California, Berkeley.
NEUTRON SPECTRA FROM AN ORGANIC SCINTILLATOR.
Doctoral thesis,
by Willis R. Young. Jun 65, 80p
Contract W-7405-eng-48

Descriptors: (*Scintillation counters, Organic materials), (*Neutron spectrum, Scintillation counters).

UCRL-6826 (Rev. 1) **Field 18L, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
COMPRESSIVE CREEP OF CERAMICS FOR HIGH-TEMPERATURE NUCLEAR REACTORS,
by Richard R. Vandervoort and Willis L. Barmore. Aug 64, 22p
Contract W-7405-eng-48

Descriptors: (*Reactor materials, Ceramic materials), (*Creep, Reactor materials).

UCRL-7495 **Field 18C**
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
CHERENKOV ELECTROMAGNETIC RADIATION FROM A NUCLEAR DETONATION IN SPACE,
by S. A. Colgate and K. S. Yee. 23 Apr 64, 41p
Contract W-7405-eng-48

Descriptors: (*Cerenkov radiation, Nuclear explosions), (*Nuclear explosions, Cerenkov radiations).

UCRL-7966 **Field 18C**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
BARRIER-PLANNING WITH NUCLEAR CRATERING EXPLOSIVES,
by Louis J. Circeo, Jr. 10 Jul 64, 21p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Cratering), (*Cratering, Nuclear explosives).

WAPD-T-1690 **Field 18D**
CFSTI Prices: HC$1.00 MF$0.50
Bettis Atomic Power Lab., Pittsburgh, Pa.
REMOTELY OPERABLE TOOLMAKERS MICROSCOPE,
by L. M. Behr and J. D. Eichenberg. May 65, 9p
CONF-651101-2
Contract AT (11-1)-GEN-14

Descriptors: (*Microscopes, Remote control systems).

WAPD-T-1782 **Field 18I**
CFSTI Prices: HC$1.00 MF$0.50
Bettis Atomic Power Lab., Pittsburgh, Pa.
STRUCTURAL ANALYSIS OF A REACTOR SUBASSEMBLY UNDER THERMAL, HYDRAULIC, AND FUEL EXPANSION LOADS,
by Carl M. Friedrich. May 65, 20p CONF-650602-35
Contract AT (11-1)-GEN-14
Prepared for presentation at American Nuclear Society Annual Meeting, (11th), Gatlinburg, Tenn.

Descriptors: (*Reactor fuel plates, Structural properties).

WAPD-T-1788 **Field 18K, 12A**
CFSTI Prices: HC$1.00 MF$0.50
Bettis Atomic Power Lab., Pittsburgh, Pa.
IMPROVED P3 VACUUM BOUNDARY CONDITIONS AND THEIR USE IN PULSE CALCULATIONS,
by E. Schmidt and E. M. Geibard. Apr 65, 13p
CONF-650802-25
Contract AT (11-1)-GEN-14
Prepared for presentation at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn., Jun 1965.

Descriptors: (*Neutron transport theory, Boundary valve problems), (*Boundary valve problems, Neutron transport theory).

WAPD-T-1792 **Field 18K, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Bettis Atomic Power Lab., Pittsburgh, Pa.
REACTOR-PLANT DYNAMICS DURING LOSS OF COOLANT,
by J. A. Redfield and S. G. Margolis. Jun 65, 11p
CONF-650602-34
Contract AT (11-1)-GEN-14

Descriptors: (*Power reactors, Dynamics), (*Reactor coolants, Reactor accidents).

WCAP-3269-32 **Field 18J, 18L**
CFSTI Prices: HC$3.00 MF$0.75
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
LARGE CLOSED-CYCLE WATER REACTOR RESEARCH AND DEVELOPMENT PROGRAM. DEVELOPMENT OF REACGR COOLANT SYSTEMS,
by H. J. Cordle. Sep 64, 61p
Contract AT (30-1)-3269

Descriptors: (*Reactor coolants, Power reactors).

WCAP-3269-38 **Field 18I**
CFSTI Prices: HC$4.00 MF$1.00
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
THE ANALYTIC REPRESENTATION OF ROD CLUSTER CONTROL ELEMENTS IN NUCLEAR DESIGN CALCULATIONS.
by W. J. Eich, H. T. Williams, Jr., and H. Aisu. Oct 64, 141p
Contract AT (30-1)-3269

Descriptors: (*Control rods, Analysis), (*Reactor cores, Design).

WCAP-5490 **Field 18D, 18C**
CFSTI Prices: HC$1.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
EVALUATION OF GAMMA SCANNING AS A TOOL FOR DETERMINING FUEL BURNUP DISTRIBUTIONS IN LARGE POWER REACTOR CORES.
From American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn.,
by R. J. Nodvik. 1964, 5p CONF-650602-9
Contract AT (30-1)-3017

Descriptors: (*Fuel burnup, Power reactors), Gamma rays, Reactor inspection.

WCAP-5495 **Field 18L, 18E**
CFSTI Prices: HC$1.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
REACTOR PHYSICS CONSIDERATIONS IN THE DESIGN OF A POWER REACTOR PARTIALLY LOADED WITH PUO2-UO2,
by H. A. Risti and A. J. Impink. 1964, 7p
CONF-650602-7
Contract AT (30-1)-3335
Presented at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Power reactors, Nuclear power plants), (Nuclear power plants, Power reactors).

Y-KA-7 **Field 18J, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
NUCLEAR MATERIALS MANAGEMENT IN A RECOVERY FACILITY FOR UNIRRADIATED ENRICHED URANIUM,
by George R. Jasny. 28 Jun 65, 15p CONF-650803-3
Contract W-7405-eng-26
Prepared for presentation at IAEA Symposium on Nuclear Materials Management, Vienna.

Descriptors: (*Reactor materials, Quality control), (*Reactor fuel enrichment, Uranium).

19. ORDNANCE

AD-463 360 **Field 19A**
CFSTI Price: HC$2.00
Naval Ordnance Lab., White Oak, Md. Explosion Dynamics Div.
INITIATION OF EXPLOSIVES BY EXPLODING WIRES. VI. FURTHER EFFECTS OF WIRE MATERIAL ON THE INITIATION OF PETN BY EXPLODING WIRES,
by Howard S. Leopold. 31 Mar 65, 34p
NOLTR-65-1
Task RUME-4E000/212-1/F008-08-11-PA-019

Descriptors: (*Exploding wires, Explosives initiators), Effectiveness, Detonations, PETN, Silver, Copper, Iron, Firing circuits.

Silver, copper, and iron wires were investigated as possible bridgewire materials. The wires were exploded by a 1-microfarad capacitor charged to 2,000 Volts. Wire materials that give high peak powers are favorable for effecting detonation. Low boiling point, low heat of vaporization metals such as silver and copper permit greater energy transfer to an explosive than high boiling point, high heat of vaporization metals such as iron. (Author)

LA-DC-6992 **Field 19D**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
ANALYSIS OF SHOCK WAVE AND INITIATION DATA FOR SOLID EXPLOSIVES,
by J. B. Ramsay and A. Popolato. 1965, 5p
CONF-651003-8
Contract W-7405-eng-36
Presented at Symposium on Detonation (4th), Silver Spring, Md.

Descriptors: (*Shock waves, Explosive materials), (*Explosive materials, Detonations).

LA-DC-6993 **Field 19D**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., N. Mex.
ON ELECTRICAL CONDUCTIVITY IN DETONATION PRODUCTS,
by Bernard Hayes. 1964, 6p CONF-651003-2
Contract W-7405-eng-36

Descriptors: (*Detonations, Electrical conductance).

Patent 3,216,356 **Field 19A, 19G**
PROJECTILE.
Patent assigned to Army,
by William F. Kaufmann, Jr. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Projectiles, Rifles), Patents, Design, Recoilless guns.

The caseless round is used in a recoilless rifle. A somewhat elastic ring is secured to the projectile and is fitted within a groove rearwardly of the projectile rotating band to extend radially outward far enough for engaging an inwardly extending ledge within the chamber of the gun. This ring is preferably of a plastic having an ultimate shear strength of about 20,000 pounds per square inch, so that on rupture of the ring, the projectile is given more rapid acceleration and velocity for a given propellant than it would have had with a metal cartridge case having a conventional base flange arrangement.

SC-RR-65-277 **Field 19D, 18C**
CFSTI Prices: HC$1.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
DIMENSIONS OF A CRATER FROM A 500-TON TNT HEMISPHERE DETONATED ON ROCK,
by L. J. Vortman. Jul 65, 25p
Contract AT (29-1)-789

Descriptors: (*Cratering, Explosive materials), (*Explosive materials, Detonations).

SC-TM-65-49 **Field 19G**
CFSTI Prices: HC$1.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
SUN SENSOR METHOD OF OBTAINING SPIN AND CONING INFORMATION FOR SMALL ROCKETS,
by Lee M. Bossart. Mar 65, 12p
Contract AT (29-1)-789

Descriptors: (*Aerodynamic characteristics, Rockets).

20. PHYSICS

AD-431 184 **Field 20K**
CFSTI Price: HC$3.00
Ohio State Univ. Research Foundation, Columbus. Dept. of Aeronautical and Astronautical Engineering.

THERMAL STRESSES DUE TO LARGE SPANWISE AND CHORD-WISE TEMPERATURE GRADIENTS IN LONG THIN PLATES.
Final technical rept., 1 Sep 62-1 Aug 63,
by A. R. Glaser, R. G. Dale and B. E. Gatewood.
Dec 63, 98p
Contract AF33 (616-8330,
Proj. AF-7063,
Task 706302
ARL 63-236

Descriptors: (*Flat plate models, Thermal stresses), Theory, Equations, Fourier analysis, Integral equations, Temperature, Strain (Mechanics), Stresses, Tests, Metal plates, Rectangular bodies.

The report contains the results of a theoretical and experimental investigation of the thermal strains and stresses produced in unrestrained long thin rectangular plates by two-dimensional temperature gradients. The temperature distributions investigated are steady-state and the stresses are calculated by solving the twodimensional plane-stress equations of elasticity theory. Two temperature variations were investigated, one in which the temperature changed about 200 F in an 8-inch distance along the span and 200 F in 4.5 inches along the chord direction; and one in which the temperature changed about 75 F in about a 2-inch distance along the span and 75 F in 4.5 inches along the chord direction. It was found that for these relatively large temperature gradients the solutions for the stresses presented in the literature were either not applicable or impractical. By modifying one of the available solutions, converting it into a Fourier integral and performing the integration by means of the theory of residues, it was possible to calculate the stresses for a specified temperature distribution with large gradients without difficulty. The calculated thermal strains compare quite well with the experimental results obtained with the smaller spanwise gradient. The temperature variation obtained in the test for the larger spanwise gradient differed from that used in the theoretical calculations so that only a qualitative comparison is made for this case. (Author)

BNWL-97 **Field 20H**
CFSTI Prices: HC$2.00 MF$0.50
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
THEORY-EXPERIMENT COMPARISON OF PU 240 RESONANCE ABSORPTION,
by C. M. Heeb. 24 May 65, 27p
Contract AT (45-1)-1830

Descriptors: (*Resonance absorption, Plutonium).

CALT-63-16 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
California Inst. of Tech., Pasadena.
MAGNETIC DIPOLE TRANSITION RATES IN DEFORMED ODD-A NUCLEI,
by J. De Boer and G. D. Symons. 1964, 4p
Contract AT (04-3)-41

Descriptors: (*Nuclear energy levels, Selection rules), (*Odd-even nuclei, Even-odd nuclei).

CAR-882-8 **Field 20H**
CFSTI Prices: HC$4.00 MF$1.00
Carnegie Inst. of Tech., Pittsburgh, Pa. Dept. of Physics.
PI (-)+P INTERACTIONS AT 646 MeV.
Doctoral thesis,
by John D. Oliver. Jan 65, 134p
Contract AT (30-1)-882
Submitted to Carnegie Inst. of Tech.

Descriptors: (*Proton reactions, Pions), (*Meson reactions, Protons).

CONF-640301 **Field 20H**
CFSTI Prices: HC$6.00 MF$1.50
Kansas. Univ., Lawrence.
SYMPOSIUM ON THE STRUCTURE OF LOW-MEDIUM MASS NUCLEI, MARCH 5 AND 6, 1964, HELD AT THE UNIVERSITY OF KANSAS, LAWRENCE, KANSAS,
ed. by L. W. Seagondollar. 1964, 226p
Contract AT (11-1)-1120

Descriptors: (*Nuclear structure, Symposia).

HUX-2752-1 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Harvard Univ., Cambridge, Mass. Dept. of Physics.
ANNUAL SUMMARY REPORT OF RESEARCH IN HIGH ENERGY NUCLEAR PHYSICS.
30 Dec 64, 23p
Contract AT (30-1)-2752

Descriptors: (*Nuclear physics, Scientific research).

HW-SA-3588 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
SUBSTRUCTURE IN THE NEUTRON TOTAL CROSS SECTION IN THE REGION OF THE GIANT RESONANCES,
by D. G. Foster, Jr. and D. W. Glasgow. 25 Jun 64, 9p
Contract AT (45-1)-1350

Descriptors: (*Neutron cross sections, Resonance), (*Nuclear structure, Neutron cross sections).

HW-89062 **Field 20F**
CFSTI Prices: HC$2.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
A 709/7090 PROGRAM FOR INDEXING X-RAY DIFFRACTION POWDER PATTERNS. III. THE ORTHORHOMBIC CASE,
by J. B. Goebel and A. S. Wilson. 2 Jun 64, 48p
Contract AT (45-1)-1350

Descriptors: (*X-ray diffraction analysis, Indexes), (*Indexes, X-ray diffraction analysis).

IITRI-578P21-9 **Field 20M**
CFSTI Prices: HC$6.00 MF$1.75
IIT Research Inst., Chicago, Ill.
STUDIES OF REACTOR CONTAINMENT. VOLUME I. DETERMINATION OF THE EQUATION OF STATE OF A POROUS SOLID.
Final rept.,
by Paul Lieberman. Feb 65, 295p
Contract AT (11-1)-578,
Proj. T-6042,
Task 2

Descriptors: (*Porous materials, Equations of state), (*Nuclear reactors, Containment).

IS-T-10 **Field 20B, 20F**
CFSTI Prices: HC$3.00 MF$0.75
Ames Lab., Iowa State Univ. of Science and Tech.
THE EFFECT OF PRESSURE ON F-CENTER LUMINESCENCE.
Master's thesis,
by Alfred Douglas Brothers, Jr. May 65, 63p
Contract W-7405-eng-82

Descriptors: (*Color centers, Pressure), (*Luminescence, Color centers).

IS-T-12 **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Ames Lab., Iowa State Univ. of Science and Tech.
ANGULAR AND ENERGY, DISTRIBUTIONS OF PHOTOPROTONS FROM COBALT-59.
Master's thesis,
by Roland Edwin Juhala. May 65, 58p
Contract W-7405-eng-82

Descriptors: (*Protons, Photonuclear reactions), (*Cobalt, Photonuclear reactions), (Photonuclear reactions, Cobalt).

IS-1111 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Ames Lab., Iowa State Univ. of Science and Tech.
THE RANDOM PHASE APPROXIMATION IN THE MANY BOSON PROBLEM,
by R. D. Etters. 1964, 16p CONF-758-26
Contract AT (11-1)-72
Presented at American Physical Society Meeting, New York, Jan 1965.

Descriptors: (*Boston, Nuclear models), (*Excitation, Elementary particles).

IS-1172 **Field 20B, 20J**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ. of Science and Technology, Ames. Inst. for Atomic Research.
RELATIVISTIC EFFECTS IN CRYSTALS,
by T. L. Loucks. 14 Jun 65, 13p CONF-650542-1
Contract W-7504-eng-42
Presented at Midwest Theoretical Conference, Columbus, Ohio.

Descriptors: (*Crystal lattices, Relativity theory), (*Relativity theory, Crystal lattices).

IS-987 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Ames Lab., Iowa State Univ. of Science and Tech.
ON THE VALIDITY OF THE POLE APPROXIMATION FOR ONE-PARTICLE EXCHANGES,
by J. Cumming, K. E. Lassila, and J. McEwan. 3 Sep 64, 12p CONF-640606-2
Contract W-7405-eng-42
Prepared for presentation to American Physical Society Summer Meeting, Denver.

Descriptors: (*Potential scattering, Approximation (Mathematics)), (*Meson scattering, Quantum mechanics).

KAPL-M-6452 **Field 20H**
CFSTI Prices: HC$2.00 MF$0.50
Knolls Atomic Power Lab., Schenectady, N. Y.
0 16 FAST NEUTRON CROSS SECTIONS AND LEGENDRE MOMENTS BELOW 15.0 MEV,
by E. L. Slaggie and J. T. Reynolds. 30 Apr 65, 33p
Contract W-31-109-eng-52

Descriptors: (*Fast neutrons, Neutron cross sections), (*Neutron cross sections, Fast neutrons).

LA-DC-5309 **Field 20D**
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
LAMINAR INCOMPRESSIBLE FLOW IN CHANNELS WITH POROUS WALLS,
by B. K. Knight, Jr. and B. B. McInteer. 1965, 40p
Contract W-7405-eng-36

Descriptors: (*Incompressible flow, Laminar flow), (*Porous materials, Laminar boundary layer).

LA-DC-6390 **Field 20H, 20J**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
EXPERIMENTAL IMPLICATION OF THE MANDELSTAM REPRESENTATION,

by George A. Baker, Jr. 1963, 6p
Contract W-7405-eng-26

Descriptors: (*Nuclear scattering, Operators (Mathematics)), (*Operators (Mathematics), Quantum mechanics).

LA-DC-6515 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
TABLES FOR THE DETERMINATION OF THE SURFACE TENSIONS OF LIQUID METALS BY THE PENDANT DROP METHOD,
by Richard M. Bidwell, J. L. Duran, Jr., and Grant L. Hubbard. 1963, 11p
Contract W-7405-eng-36

Descriptors: (*Surface tension, Tables), (*Liquid metals, Surface tension).

LA-DC-6603 **Field 20I, 20C**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
EFFECT OF INNER FIELD FLUCTUATIONS ON PLASMA IMPEDANCE,
by O. Theimer. 1964, 25p
Contract W-7405-eng-36

Descriptors: (*Plasma medium, Electrical impedance), (*Field theory, Plasma medium).

LA-DC-6632 **Field 20H, 12A**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
A UNIQUENESS THEOREM CONCERNING MOMENT DISTRIBUTIONS,
by R. K. Zeigler. 1960, 5p
Contract W-7405-eng-36

Descriptors: (*Particle size, Distribution), (*Distribution functions, Theorems).

LA-DC-6674 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
FISSION MASS YIELD STUDIES,
by G. P. Ford and R. B. Leachman. 1964, 18p CONF-650301-12
Contract W-7405-eng-36
Prepared for presentation at Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission products, Mass number), (*Uranium compounds, Fission).

LA-DC-6675 **Field 20H, 18K**
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
PROMPT NEUTRONS FROM FISSION,
by James Terrell. 1964, 30p CONF-650301-13
Contract W-7405-eng-36
Prepared for presentation at Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Prompt neutrons, Fission), (*Fission, Prompt neutrons).

LA-DC-6754 **Field 20G**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
NUMERICAL STUDIES OF THE SHAPES OF DRIFT TUBES AND LINAC CAVITIES,
by Harry C. Hoyt. 1965, 7p CONF-650306-37
Contract W-7405-eng-36
Presented at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Linear accelerators, Design).

LA-DC-6757 **Field 20G**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE DESIGN OF HIGH-INTENSITY MUON CHANNELS FOR A MESON FACILITY,
by H. S. Butler. 1964, 4p CONF-650306-34
Contract W-7405-eng-36
Prepared for presentation at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Meson bombardment, Muons), (*Particle accelerators, Muons).

LA-DC-6758 **Field 20G, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE APPLICATION OF DIGITAL COMPUTER TO THE CONTROL AND MONITORING OF A PROTON LINEAR ACCELERATOR,
by T. M. Putnam, R. A. Jameson and T. M. Schultheis. 1965, 4p CONF-650306-35
Contract W-7405-eng-36
Prepared for presentation at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Linear accelerators, Control), (*Digital computers, Proton accelerators).

LA-DC-6797 **Field 20G**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
A 40-KILOVOLT, 125-AMPERE HARD TUBE MODU- LATOR FOR ACCELERATOR SERVICE,
by R. W. Freyman. 1965, 7p CONF-650306-39
Contract W-7405-eng-36
Prepared for presentation at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerator components, Modulators).

LA-DC-7086 **Field 20M**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE COEXISTENCE CURVE OF HE 3,
by Robert H. Sherman. 1964, 7p CONF-650425-1
Contract W-7405-eng-36
Presented at Conference on Phenomena in the Neighborhood of the Critical Point, Washington, D. C.

Descriptors: (*Thermodynamics, Helium), (*Helium, Liquefied gases).

LA-DC-7096 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
HIGH RESOLUTION MEASUREMENTS OF GAMMA RAYS FROM NEUTRON INELASTIC SCATTERING,
by Robert B. Day and John M. Palms. 1964, 5p CONF-650706-20
Contract W-7405-eng-36
Presented at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Neutron scattering, Inelastic scattering), (*Gamma-ray scattering, Nuclear energy levels).

LA-DC-7147 **Field 20G, 13A**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
AN AUTOMATIC LIQUID NITROGEN DISTRIBUTION SYSTEM FOR TWENTY FIVE COLD TRAPS,
by J. H. Fretwell and J. R. Bartlit. 1963, 12p CONF-650802-5
Contract W-7405-eng-36
Presented at Cryogenic Engineering Conference, Houston, Tex.

Descriptors: (*Electrostatic accelerators, Cooling), (*Cryogenics, Electrostatic accelerators).

LA-DC-7169 **Field 20M, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
PROJECT ROVER. CRYOGENIC EVALUATION LABORATORY,
by R. W. Stokes. 1964, 28p CONF-650502-2
Contract W-7405-eng-36
Presented at Cryogenic Engineering Conference, Houston, Tex.

Descriptors: (*Cryogenics, Nuclear physics laboratories), (*Nuclear physics laboratories, Cryogenics), (*Nuclear propulsion, Space propulsion).

LA-DC-7170 **Field 20M, 21F**
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
LIQUID HYDROGEN IN NUCLEAR ROCKET TESTING,
by Frederick J. Edeskuty. 1965, 32p CONF-650611-8
Contract W-7405-eng-36
Presented at Symposium on Heat Flow Below 100 deg K and its Technological Applications, Grenoble, France.

Descriptors: (*Hydrogen, Rocket Propulsion), (*Nuclear propulsion, Rocket propulsion).

Identifiers: K1WI.

LA-DC-7224 **Field 20M, 21F**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
HEAT TRANSFER IN MISSILES AND SPACE OPERATIONS,
by Keith Boyer. 1965, 21p CONF-650611-2
Contract W-7405-eng-36
Prepared for presentation at Symposium on Heat Flow Below 100 Deg K Audits Technological Applications, Grenoble, France.

Descriptors: (*Heat transfer, Cryogenic propellants), (*Cryogenic propellants, Heat transfer), (*Space propulsion, Cryogenic propellants).

LA-3306 **Field 20D, 19D**
CFSTI Prices: HC$4.00 MF$1.00
Los Alamos Scientific Lab., Univ. of California, N. Mex.
STABILITY OF DETONATIONS FOR DISTURBANCES OF SMALL TRANSVERSE WAVELENGTH,
by Jerome J. Erpenbeck. Mar 65, 136p
Contract W-7405-eng-36

Descriptors: (*Detonations, Stability).

LADC-6186 **Field 20H**
CFSTI Prices: HC$2.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
PIONS, MUONS AND NUCLEAR STRUCTURE,
by Charles L. Critchfield, Leon Heller, Clarence E. Lee, and James E. Young. 1963, 30p
Contract W-7405-eng-36

Descriptors: (*Nuclear structure, Elementary particles), (*Pions, Muons).

LADC-6480 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. California, N. Mex.
FORWARD SCATTERING,
by George A. Baker, Jr. 1964, 5p
Contract W-7405-eng-36

Descriptors: (*Elementary particles, Scattering), (*Nuclear scattering, Elementary particles).

LAMS-3017 **Field 20M, 11F**
CFSTI Prices: HC$4.00 MF$0.75
Los Alamos Scientific Lab., Univ. of California, N. Mex.
RADIATIVE AND CONDUCTIVE OPACITIES AND MONOCHROMATIC ABSORPTION COEFFICIENTS FOR IRON AND ALUMINUM,
by Arthur N. Cox. Apr 62, 118p
Contract W-7405-eng-36

Descriptors: (*Iron, Thermodynamics), (*Aluminum, Thermodynamics).

MATT-289 **Field 20I**
CFSTI Prices: HC$1.00 MF$0.50
Princeton Univ., N. J. Plasma Physics Lab.
EXTENSION OF SUYDAMS CONDITION FOR PLASMA STABILITY TO INCLUDE FINITE LARMOR RADIUS EFFECTS,
by T. E. Stringer. Jul 64, 7p
Contract AT (30-1)-1238

Descriptors: (*Plasma physics, Stability), (*Confinement, Plasma physics).

MATT-369 **Field 20I, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Princeton Univ., N. J. Plasma Physics Lab.
A MICROWAVE SYSTEM FOR LOW DENSITY MEASUREMENTS,
by A. M. Levine, A. F. Kuckes, and A. Skislak.
Jul 65, 9p
Contract AT (30-1)-1238

Descriptors: (*Probes (Electromagnetic), Microwave frequency), (*Plasma medium, Probes (Electromagnetic)).

MIT-2098-142 **Field 20H, 7E, 20G**
CFSTI Prices: HC$5.00 MF$1.00
Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science.
PROGRESS REPORT ON PHYSICS AND CHEMISTRY.
1 Nov 64, 151p
Contract AT (30-1)-905

Descriptors: (*Nuclear physics, Reviews), (*Radiochemistry, Reviews).

MURA-714 **Field 20G**
CFSTI Prices: HC$9.42 MF$3.25
Midwestern Universities Research Assn., Stoughton, Wis.
MINUTES OF THE 1964 CONFERENCE ON PROTON LINEAR ACCELERATORS HELD AT MIDWESTERN UNIVERSITIES RESEARCH ASSOCIATION, JULY 2024, 1964,
ed. by F. E. Mills, D. A. Swenson, C. D. Curtis, and D. E. Young. 1964, 642p CONF-650
Contract W-31-109-eng-38

Descriptors: (*Proton accelerators, Linear accelerators), (*Symposia, Accelerators).

N65-15052 **Field 20D, 21I**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
ANALYTICAL INVESTIGATION OF SOME IMPORTANT PARAMETERS IN THE PRESSURIZED LIQUID HYDROGEN TANK OUTFLOW PROBLEM,
by D. A. Mandell and W. H. Roudebush. 1964, 24p NASA-TM-X-52074
Presented at the Conf. on Propellant Tank Pressurization and Stratification, Huntsville, Ala., 20-21 Jan 1965.

Descriptors: (*Liquefied gases, Gas flow), (*Propellant tanks, Gas flow).

N65-17507 **Field 20M**
CFSTI Prices: HC$2.00 MF$0.50
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
CHEMICAL REACTIVITY OF HYDROGEN, NITROGEN AND OXYGEN ATOMS AT TEMPERATURES BELOW 100 DEGREES K,
Semiannual technical rept. no 4,
by D. B. Bivens, T. J. Malone, W. J. Martin, H. A. McGee, and J. H. Wilson. 1 Jan 65, 32p
Grant NSG-337
NASA CR-60870

Descriptors: (*Cryogenics, Liquefied gases), (*Liquefied gases, Reaction kinetics).

N65-18254 **Field 20E**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
GEOS-1 LASER RETROREFLECTOR DESIGN AND PRELIMINARY SIGNAL CALCULATIONS,
by H. H. Plotkin. Jul 64, 20p NASA-TM-X-55129, X-524-64-205

Descriptors: (*Lasers, Spaceborne).

Identifiers: GEOS-1.

N65-20652 **Field 20I**
CFSTI Prices: HC$3.00 MF$0.75
Princeton Univ., N. J. Dept. of Aerospace and Mechanial Sciences.
PULSED ELECTROMAGNETIC GAS ACCELERATION.
Semiannual progress rept. no. 5, 1 Jul 31 Dec 64,
by Robert G. Jahn and Woldemar F von Jaskowsky. 29 Jan 65, 61p Rept. no. 634d
Grant NsG-306-63
NASA CR-57570

Descriptors: (*Plasma medium, Acceleration).

N65-21318 **Field 20N, 4A**
CFSTI Prices: HC$2.00 MF$0.50
Alaska Univ., College. Geophysical Inst.
ABERRATIONS OF RADIO SIGNALS TRAVERSING THE AURORAL IONOSPHERE.
Interim rept. no. 1, 1 Aug 64-31 Jan 65,
by Edward J. Premouw. 31 Jan 65, 33p
Contract NAS5-3940
NASA CR-57942
Microfilmed from best available copy.

Descriptors: (*Ionospheric propagation, Aurorae), (*Radio signals, Aurorae).

N65-21331 **Field 20C, 10A**
CFSTI Prices: HC$3.00 MF$0.50
Field Emission Corp., McMinnville, Oreg.
INVESTIGATION OF ELECTRON EMISSION CHARACTERISTICS OF LOW WORK FUNCTION SURFACES.
Quarterly progress rept. no. 1, 28 Sep-27 Dec 64,
by L. W. Swanson and L. C. Crouser. 27 Jan 65, 61p
Contract NASw-1082
NASA CR-57947

Descriptors: (*Field emission, Work functions).

N65-34246 **Field 20D, 20M**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EXPERIMENTAL STUDY OF TEMPERATURE DISTRIBUTION IN LAMINAR FLOW OF A HEATGENERATING FLUIDS IN RECTANGULAR CHANNELS,
by Mary K. Strite and Robert M. Inman. Oct 65, 37p
NASA TN-D-3039

Descriptors: (*Laminar flow, Heat transfer), (*Heat transfer, Laminar flow).

N65-34505 **Field 20I**
CFSTI Prices: HC$4.00 MF$1.00
Texas Univ. Austin.
CURRENT SHEATH DYNAMICS AND MAGNETOSONIC OSCILLATIONS IN MAGNETOPLASMAS,
by Otto M. Friedrich, Jr. and Arwin A. Dougal.
Oct 65, 138p
Grant NsG-353
NASA CR-309

Descriptors: (*Plasma oscillations, Magnetohydrodynamics), (*Magnetohydrodynamics, Plasma medium).

N65-34699 **Field 20H**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
PERFORMANCE CORRELATION FOR ELECTRONBOMBARDMENT ION SOURCES,
by Harold R. Kaufman. Oct 65, 34p
NASA TN-D-3041

Descriptors: (*Ion sources, Electron bombardment), (*Electron bombardment, Ion sources).

NAA-SR-MEMO-3196 **Field 18I**
CFSTI Prices: HC$2.00 MF$0.50
Atomics International, Canoga Park, Calif.
PRE-CRITICAL ELECTRICAL AND MECHANICAL TESTING, THE CRITICAL ASSEMBLY, REACTOR PARAMETERS,
by R. P. Johnson. 16 Oct 58, 34p
Contract AT (11-1)-GEN-8

Descriptors: (*Critical assemblies, Reactor lattice parameters), (*Reactor lattice parameters, Critical assemblies).

NAA-SR-MEMO-7753 **Field 18J**
CFSTI Prices: HC$2.00 MF$0.50
Atomics International, Canoga Park, Calif.
FABRICATION RECORDS OF OMRE TEST ELEMENTS 9-2 AND 10-1,
by H. G. Hayes. 28 Sep 62, 41p
Contract AT (11-1)-GEN-8

Descriptors: (*Reactor fuel elements, Tests), (*Organic moderated reactors, Reactor fuel elements).

NAA-SR-MEMO-9524 **Field 13K, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Atomics International, Canoga Park, Calif.

NAA PROGRAM DESCRIPTION. TURBO-PUMP CODE,
by J. A. Hessler. Feb 64, 40p
Contract AT-11-1-GEN-8

Descriptors: (*Turbopumps, Performance (Engineering)), (*Programming (Computer), Turbopumps).

NEVIS-131 **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Nevis Labs., Columbia Univ., Irvington-on-Hudson, N. Y.
THE PROPERTIES OF THE OMEGA AND PHI MESONS.
Doctoral thesis,
by David C. Miller. Apr 65, 80p CU-237, R-489
Contract AT (30-1)-1932
Task I
Submitted to Columbia Univ., New York.

Descriptors: (*Mesons, Physical properties).

NYO-1480-20 **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
ASYMPTOTIC WAVE FUNCTIONS FOR ATOMIC SYSTEMS.
by Lawrence Mendelshon and Jerome Percus. 30 Apr 65, 64p
Contract AT (30-1)-1480

Descriptors: (*Atoms, Wave functions), (*Wave functions, Atoms).

NYO-1480-22 **Field 20I**
CFSTI Prices: HC$3.00 MF$0.75
Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
STABILITY CRITERIA AND THE INITIAL VALUE PROBLEM FOR COLLISIONLESS, GUIDING CENTER PLASMA,
by Abraham Kadish. 1 Apr 65, 71p MP-45
Contract AT (30-1)-1480

Descriptors: (*Plasma physics, Stability), (*Magnetic fields, Plasma physics).

NYO-1807-10 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Yale Univ., New Haven, Conn.
DIRECT EVIDENCE FOR THE ODD-EVEN L. ANOMALY IN INELASTIC SCATTERING,
by K. R. Greider. 1964, 20p
Contract AT (30-1)-1807

Descriptors: (*Inelastic scattering, Nuclear particles).

NYO-2150-4 **Field 20L**
CFSTI Prices: HC$1.00 MF$0.50
Cornell Univ., Itahca, N. Y. Materials Science Center.
NMR CALIBRATION OF SUPERCONDUCTING MAGNETS,
by B. W. Maxfield and J. R. Merrill. 17 Feb 65, 17p MSC-321
Contract AT (30-1)-2150

Descriptors: (*Nuclear magnetic resonance, Superconductors), (*Superconductors, Magnets).

NYO-2391-11 **Field 20B**
CFSTI Prices: HC$2.00 MF$0.50
Cornell Univ., Ithaca, N. Y. Lab. of Atomic and Solid State Physics.
SCATTERING OF LONG WAVELENGTH PHONONS BY POINT IMPERFECTIONS IN CRYSTALS,
by J. A. Krumhansl and J. A. D. Matthew. Jun 65, 29p
Contract AT (30-1)-2391

Descriptors: (*Crystal lattice defects, Phonons), (*Phonons, Scattering).

NYO-2404-5 **Field 20M**
CFSTI Prices: HC$1.00 MF$0.50
Atlantic Research Nuclear Corp., Alexandria, Va.
EFFECTS OF ELECTRICAL FIELDS ON BOILING HEAT TRANSFER.
Quarterly progress rept. for 26 May-30 Sep 64,
by Charles R. Nichols, Jack M. Spurlock and Michael Markels, Jr. 21 Dec 64, 25p
Contract AF (30-1)-2404

Descriptors: (*Boiling, Heat transfer), (*Electric fields, Boiling).

NYO-2404-70 **Field 20M**
CFSTI Prices: HC$2.00 MF$0.50
Atlantic Research Corp., Alexandria, Va.
EFFECTS OF ELECTRICAL FIELDS ON BOILING HEAT TRANSFER.
Quarterly progress rept., Jan 1-Mar 31, 65,
by Charles R. Nichols, Jack M. Spurlock, and Michael Markels, Jr. 31 Mar 65, 29p
Contract AT (30-1)-2404

Descriptors: (*Heat transfer, Electric fields), (*Boiling, Heat transfer).

NYO-2471-2 **Field 20L**
CFSTI Prices: HC$2.00 MF$0.50
Cornell Univ., Ithaca, N. Y. Materials Science Center.
ELECTRONIC PROPERTIES OF SURFACE LAYERS OF SILVER CHLORIDE,
by Benjamin B. Snavely. 17 Aug 64, 33p Rept. no. 342
Contract AT (30-1)-2471

Descriptors: (*Silver compounds, Electromagnetic properties), Chlorides.

Identifiers: Silver chloride.

ORNL-P-1226 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
NEUTRON CAPTURE CROSS SECTIONS FROM 5 TO 100 keV,
by R. L. Macklin and J. H. Gibbons. 1965, 7p CONF-650706-1
Contract W-7405-eng-26
Prepared for Presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp., 19-23 Jul 1965.

Descriptors: (*Neutron capture, Neutron cross sections), (*Neutron cross sections, Neutron capture).

ORNL-P-1245 **Field 20I**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
THE PRODUCTION OF 10-9 TORR WITHIN A LARGE PLASMA CONTAINER (DCX-1),
by E. R. Wells. 1964, 31p CONF-650512-2
Contract W-7405-eng-26
Presented at Symposium on Engineering Problems of Controlled Thermonuclear Research, Livermore, Calif.

Descriptors: (*Plasma physics, Low-pressure research), (*Low-pressure research, Plasma physics).

ORNL-P-1302 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
THE INTERACTION OF 360 KEV POLARIZED NEUTRONS WITH ORIENTED 165 HO NUCLEI,
by R. Wagner, P. D. Miller and T. Tamura. 1965, 5p CONF-650706-12
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp. Prepared in cooperation with National Bureau of Standards, Washington, D. C.

Descriptors: (*Neutron reactions, Holmium).

ORNL-P-1304 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
ENERGY DEPENDENCE OF THE 10B (N, ALPHA)/10B (N, ALPHA GAMMA) RATIO,
by R. L. Macklin and J. H. Gibbons. 1965, 9p

Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons Antwerp.

Descriptors: (*Alpha particle reactions, Neutron reactions), (*Neutron reactions, Boron).

ORNL-P-1307 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
NEUTRON RESONANCE CAPTRUE IN 2S-1D SHELL NUCLEI,
by I. Bergovist, J. A. Biggerstaff and J. H. Gibbons. 1965, 5p CONF-650706-10
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Neutron capture, Resonance scattering), (*Nuclear shell models, Neutron capture).

ORNL-P-1343 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
FAST NEUTRON CAPTURE GAMMA-RAY SPECTRUM FROM 238 U (N, GAMMA) 239 U,
by I. Bergovist. 1965, 6p CONF-650706-4
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Neutron capture, Fast neutrons), (*Gamma-ray spectra, Uranium).

ORNL-P-1345 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
ON RADIATIVE TRANSITION IN 207 PB and 208 PB FOLLOWING RESONANCE NEUTRON CAPTURE ON 206 PB and 207 PB,
by J. A. Biggerstaff, J. R. Bird, and J. H. Gibbons. 1964, 3p CONF-650706-6
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Neutron capture, Lead), (*Resonance absorption, Neutron capture).

ORNL-P-1346 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
NEUTRON RESONANCE STRUCTURE AND S-WAVE STRENGTH FUNCTION OF THE EVEN ISOTOPES OF ZIRCONIUM,
by J. A. Biggerstaff, W. M. Good and H. J. Kim. 1964, 4p CONF-650706-7
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Neutron reactions, Wave functions), (*Even-even nuclei, Zirconium).

ORNL-P-1352 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
STRONG p-WAVE NEUTRON RESONANCES IN 120Sn, 118Sn AND 124Sn,
by J. A. Harvey and Toyojiro Fuketa. 1963, 4p
CONF-650706-8
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutron, Antwerp.

Descriptors: (*Neutron capture, Tin), (*Resonance absorption, Neutron capture).

ORNL-P-1353 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
HIGH RESOLUTION MEASUREMENTS OF GAMMA RAYS FROM THERMAL AND RESONANCE NEUTRON CAPTURE IN 117Sn, 118Sn and 120Sn,
by J. A. Harvey and G. G. Slaughter. 1965, 5p
CONF-650706-9
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Gamma-ray spectra, Neutron capture), (*Neutron capture, Tin).

ORNL-P-1354 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
LEVEL SPACING AND S-WAVE NEUTRON STRENGTH FUNCTION OF THE ODD-Z ODD-N NUCLIDE 138,
by J. A. Harvey and G. G. Slaughter. 1965, 4p
CONF-650706-2
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Nuclear energy levels, Odd-odd nuclei), (*Neutron scattering, Wave functions).

ORNL-P-1356 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
INTERMEDIATE STATES AS OBSERVED BY DIFFERENTIAL SCATTERING OF NEUTRONS BY DOUBLY CLOSED SHELL NUCLEI,
by C. H. Johnson and J. L. Fowler. 1964, 5p
CONF-650706-3
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp.

Descriptors: (*Neutron scattering, Nuclear energy levels), (*Nuclear shell models, Neutron scattering).

ORNL-P-1375 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
ON THE ABSOLUTE VALUE AND ENERGY DEPENDENCE ON THE 3 He (n,p)T REACTION,
by R. L. Macklin and J. H. Gibbons. 1964, 10p
CONF-650706-16
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Study of Nuclear Structure with Neutrons, Antwerp., 19-23 Jul 1965.

Descriptors: (*Proton scattering, Tritium), (*Neutron Flux, Measurement).

ORNL-P-1396 **Field 20L**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
A NOTE ON THE DETERMINATION OF A METASTABLE MISCIBILITY GAP FROM INTEGRATED SMALL-ANGLE X-RAY SCATTERING DATA,
by R. W. Hendricks and B. S. Boric. 1965, 27p
CONF-650629-1
Contract W-7405-eng-26
Presented at Conference on Small-angle X-ray scattering, Syracuse, N. Y., 24-26 Jun 1965.

Descriptors: (*X-ray diffraction analysis, Solid solutions), (*Phase studies, X-ray diffraction analysis).

ORNL-P-1419 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
INFORMATION ON CONVERSION COEFFICIENTS FROM COULOMB EXCITATION AND LIFE-TIME MEASUREMENTS,
by P. H. Stelson. 1965, 22p CONF-650525-5
Contract W-7405-eng-26
Prepared for presentation at International Conference on the Internal Conversion Process, Nashville, Tenn.

Descriptors: (*Internal conversion, Excitation), (*Excitation, Internal conversion).

ORNL-P-330 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Oak Ridge National Lab., Tenn.
EXCITATION OF THE FIRST LEVEL OF 12C BY 156 MEV PROTONS,
by R. M. Haybron and H. McManus. 1963, 14p
Contract W-7405-eng-26
Prepared in cooperation with Michigan State Univ., East Lansing.

Descriptors: (*Carbon, Excitation), (*Proton bombardment, Carbon), Nuclear energy levels.

ORNL-TM-1082 **Field 20G**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
RECENT PROGRESS ON THE SEPARATED ORBIT CYCLOTRON.
Jun 65, 30p
Contract W-7405-eng-26
Presented at New York Meeting, American Physical Society, 27-30 Jan 1965.

Descriptors: (*Cyclotrons, Performance (Engineering)).

ORNL-TM-1171 **Field 20H, 18K**
CFSTI Prices: HC$5.00 MF$1.00
Oak Ridge National Lab., Tenn.
A NEW METHOD FOR THE EVALUATION OF NEUTRON EMISSION, KERMA, KERMA EQUIVALENT, DOSE EQUIVALENT AND THE SPECTRUM BELOW 1 Mev FOR (ALPHA N) SOURCES, USING BONNER SPHERES,
by S. K. Mehta. Jul 65, 154p
Contract W-7405-eng-26

Descriptors: (*Neutron spectrum, Alpha particle reactions), (*Neutron detectors, Radiation damage).

ORNL-TM-1189 **Field 20K, 12A**
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
A TECHNIQUE FOR CALCULATING FREQUENCY RESPONSE AND ITS SENSITIVITY TO PARAMETER CHANGES FOR MULTIVARIABLE SYSTEMS,
by T. W. Kerlin and J. L. Lucius. 24 Jun 65, 27p
Contract W-7405-eng-26

Descriptors: (*Dynamics, Matrix algebra), (*Differential equations, Programming (Computers)).

Patent 3,216,649 **Field 20D, 1A**
GENERATORS OF ROTATING FLOW PATTERNS.
Patent assigned to Air Force,
by Joseph V. Foa. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Vortices, Production), (*Energy, Transport properties), Patents, Fluid flow, Flow fields, Stalling, Angle of attack.

The apparatus produces a rotating pseudo-blade pattern without the use of a rotor or other moving mechanical parts. This is achieved by making unique use of the phenomenon of stalling. The energy exchange can be useful in the generation of thrust, in pumping, compressing, supercharging, transporting, dredging and drilling systems.

PB-168 617 **Field 20D, 13F**
CFSTI Prices: HC$2.00 MF$0.50
Naval Ordnance Test Station, China Lake, Calif.
LOW-SPEED TESTS OF THE SNORT TRACK HORIZONTAL MOMENTUM EXCHANGE WATERBRAKE.
Rept. for 21-30 Sep 54,
by D. P. Ankeney and R. W. Murphy. 22 Jul 55, 35p NAVORD-4881, NOTS-1177
Proj. SNORT,
Task A-Xa-3-1
AD 69 531

Descriptors: (*Water brakes, Tests), Performance (Engineering), Acceleration, Momentum.

A series of evaluation tests on a horizontal momentum exchange waterbrake were performed on the SNORT track at the U. S. Naval Ordnance Test Station, China Lake, to experimentally verify theoretically predicted waterbrake performance. This report discusses the test runs that were made for a 675 fps brake entrance velocity. Telemetered information from load cells and accelerometers as well as sled borne camera information was obtained. The actual sled stopping distance was 15% longer than the theoretically predicted distance, and the peak deceleration was 40-50% under the theoretically predicted maximum. This discrepancy is believed to be due to 'choking' or internal restricting flow phenomena in the ducts of the waterbrake. Further investigation into this 'choking' phenomena is recommended. Local water roughness (1/2 inch ripples spaced 4 to 6 inches apart) as experimentally shown by the instrumentation caused no impulsive 'jerking' of braking forces. An explanation for the absence of the jerking forces is advanced. (Author)

PB-168 895 **Field 20K, 1E**
CFSTI Prices: HC$4.00 MF$0.75
Naval Air Engineering Facility, Philadelphia, Pa. Engineering Dept.
CABLE DYNAMICS,
by Friedrich O. Ringleb. 27 Dec 56, 102p
NAEF-ENG-6169
AD 130 517

Descriptors: (*Cables (Mechanical), Dynamics), (*Arresting gear, Cables (Mechanical)), Elasticity, Equations of motion, Stresses, Motion, Partial differential equations, Wave functions.

A systematical treatment of cable dynamics is presented with particular respect to recent developments in, but without restriction to, aircraft arresting gear application. The examples which are included refer generally to arresting devices, and the numerous comparisons between theoretical and measured results make use of much of the experimental work conducted during arresting gear development tests.

PB-168 899 **Field 20K**
CFSTI Prices: HC$1.00 MF$0.50
Delaware Univ., Newark. Dept. of Mechanical Engineering.
CERTAIN APPROXIMATE ANALYSES OF LARGE DEFLECTIONS OF CYLINDRICAL SHELLS.
Rept. no. 4,
by J. L. Nowinski and I. A. Ismail. Mar 64, 21p
Technical rept. TR-29
Grants NSF-G2072, NSF-GP-14239

Descriptors: (*Elastic shells, Deflection), (*Cylindrical bodies, Deflection), (*Structural shells, Deflection), Approximation (Mathematics), Numerical analysis, Panels (Structural), Equations.

Simplified equations for large deflections of elastic shells are derived using Berger's approach. The equations are specialized to circular cylindrical shells. A rectangular panel with any aspect ratio and an infinitely long panel, both simply supported at the edges, are treated in detail. A numerical example concerning a square panel is given, and the results compared with some other known solutions. (Author)

PB-168 912 **Field 20C, 9C, 20G**
CFSTI Prices: HC$1.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge. Dept. of Electrical Engineering.
THE ROLE OF POLITIVE IONS IN HIGH VOLTAGE BREAKDOWN IN VACUUM,
by H. C. Bourne, Jr., R. W. Cloud and J. G. Trump. 1953, 17p
Grant NSF-G99

Descriptors: (*Ion bombardment, Vacuum), (*Secondary emission, Metals), Electrons, Ions, Voltage, Gas ionization, Aluminum, Steel, Magnesium, Copper, Gold, Lead, Hydrogen, Helium, Nitrogen, Xenon, Mercury.

Measurements were made of the electron emission from targets of aluminum, steel, magnesium, copper, gold, and lead when bombarded by ions from hydrogen, helium, nitrogen, xenon, and mercury. The ions, whose energy was varied over the range from 10 to 140 kilovolts, were produced by ionization of the residual gas in the anode electrode and emerged through a small opening into an essentially uniform accelerating field. An initial rapid rise of electron emission with ion energy was followed in all cases by a slow linear increase. The emission ratio varied from 2 to 20 and was maximum for nitrogen ions on steel. The dependence on extractive gradient at the bombarded metal surface was slight and no simple dependence on the nature of the ion or of the bombarded metal was observed. The significance of these measurements on the electron-ion interaction theory of high voltage breakdown in vacuum is discussed. (Author)

PB-169 009 **Field 20F, 9D, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Michigan Univ., Ann Arbor. Willow Run Labs.
OPTICAL DATA-PROCESSING AND FILTERING SYSTEMS,
by Louis J. Cutrona, Emmett N. Leith, Carmen J.Palermo and Leonard J. Porcello. Apr 60, 42p
2831-20-T; 2900-123-T
Contracts AF33 (600)-38019, DA-36-039-sc-78801,
Proj. MICHIGAN
AD 236 158
Distribution: No limitation.

Descriptors: (*Optical filters, Data processing systems), (*Data processing systems, Optical equipment), Communication theory, Optics.

Identifiers: Michigan project.

Optical systems, which inherently possess two degrees of freedom rather than the single degree of freedom available in a single electronic channel, offer some advantages over their electronic counterparts for certain applications. Coherent optical systems have the added property that one may easily obtain many successive two-dimensional Fourier transforms of any given light amplitude distribution, or, by using astigmatic optics, one may obtain onedimensional transforms. Therefore, most linear operations of an integral-transform nature are easily implemented. The optical implementation of integral transforms which are of importance to communication theory is discussed; the general problems of optical-filter synthesis and multichannel computation and data processing are introduced, followed by a discussion of potential applications. Astigmatic systems, which permit multichannel operation in lieu of two-dimensional processing, are treated as a special case of general two-dimensional processors. Complex input functions are discussed with reference to their role in coherent optical systems. (Author)

PB-169 029 **Field 20N**
CFSTI Prices: HC$2.00 MF$0.50
Federal Aviation Agency, Kansas City, Mo. Installation and Materiel Div.
CANCELLATION OF RADIO WAVE REFLECTIONS.
Final rept.,
by Kermit B. Karns. Jan 64, 31p
Proj. 110-101-2

Descriptors: (*Radio transmission, Radio interference), (*Radio interference, Electromagnetic wave reflections), Radio waves, Reflection, Metals, Structures, Phase distortion, Attenuation.

A solution to the problem of interference to a radio station's transmission by reflection of its own signals from nearby metallic objects is revealed. This is done by simply introducing another reflection out of phase but equal (or approximately so) in amplitude. Out-ofphase wave interference is thereby created which effectively reduces the over-all reflection amplitude. This is accomplished by installing, or arranging for, a secondary reflector in front of the offending reflector at a critical spacing. Restoration to use is now possible for many unflyable portions of air navigation radio aids such as VHF Omniranges and Instrument Landing Systems which are operated by the Federal Aviation Agency as well as other entities. It represents an answer for the problem of radio wave reflections from nearby metallic objects in most cases when that situation causes difficulty. (Author)

PPAD-2137-536 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Princeton - Pennsylvania Accelerator, Princeton, N. J.
X-RAYS EMITTED IN COINCIDENCE WITH THE FISSION OF CF 252,
by R. A. Atneosen, W. M. Gibson andM. L. Perlman. 26 Jan 65, 22p CONF-650301-14
Contract AT (30-1)-2137
Prepared for presentation at Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission, Californium), (*X-rays, Fission).

PPAD-2137-542 **Field 20G**
CFSTI Prices: HC$1.00 MF$0.50
Princeton - Pennsylvania Accelerator, Princeton, N. J.
ANALYSIS OF LONGITUDINAL ACCELERATOR INSTABILITIES,
by Robert L. Pease. 18 Feb 65, 19p CONF-650306-23
Contract AT (30-1)-2137
Presented at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Stability).

PPAD-2137-543 **Field 20G**
CFSTI Prices: HC$1.00 MF$0.50
Princeton -- Pennsylvania Accelerator, N. J.
THE EXTERNAL PROTON BEAM FOR THE PRINCETON-PENNSYLVANIA ACCELERATOR.
by J. W. Benoit, K. B. Conner andJ. Kirchgessner. 10 Mar 65, 12p CONF-650306-47
Contract AT (30-1)-2137
Prepared for presentation at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Proton beams, Synchrotrons), (*Synchrotrons, Proton accelerators).

PPAD-2137-546 **Field 20G, 20H**
CFSTI Prices: HC$1.00 MF$0.50
Princeton - Pennsylvania Accelerator, Princeton, N. J.
CALCULATION OF SPACE CHARGE EFFECTS IN BEAM TRANSPORT,
by R. C. Catura. 10 Mar 65, 19p CONF-650306-61
Contract AT (30-1)-2137
Presented at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle beams, Space charges), (*Particle accelerators, Particle beams).

PUC-1964-148 **Field 20G**
CFSTI Prices: HC$4.00 MF$0.75
Palmer Physical Lab., Princeton Univ., N. J.
FREQUENCY SHIFTS IN ATOMIC BEAMS RESONANCES (THESIS),
by William Happer, Jr. Jul 64, 123p
Contract AT (30-1)-937

Descriptors: (*Molecular beams, Frequency shift), (Magnetic resonance, Molecular beams), (*Atoms, Molecular beams).

SAN-409-23 **Field 20M**
CFSTI Prices: HC$1.00 MF$0.50
Geoscience Ltd., Solana Beach, Calif.
HIGH ACCELERATION FIELD HEAT TRANSFER FOR AUXILIARY SPACE NUCLEAR POWER SYSTEMS.
Quarterly technical rept. 1 Dec 64-28 Feb 65,
by H. F. Poppendiek, N. D. Greene, C. M. Sabin, L. V. Felgenbutz, and P. E. Schwartz. 28 Feb 65, 17p
Contract AT (04-3)-409

Descriptors: (*Auxiliary power plants, Heat transfer), (*Heat transfer, Auxiliary power plants).

SC-DC-65-1500 **Field 20J, 7D**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
RESULTS OF AUGMENTED PLANE WAVE CALCULATIONS OF THE BAND STRUCTURE OF CERIUM METAL,
by J. T. Waber and A. C. Switendick. Jun 65, 14p (CONF-650804-5)
Contract AT (29-1)-789
Prepared for presentation at Rare Earth Research Conference (5th), Ames, Iowa.

Descriptors: (*Cerium, Band theory of solids), (*Band theory of solids, Cerium).

SCL-DR-65-28 **Field 20K**
CFSTI Prices: HC$2.00 MF$0.50
Sandia Corp., Livermore, Calif.
DYNAMIC BUCKLING OF AN ELASTICALLY SUPPORTED THIN CYLINDRICAL SHELL UNDER DYNAMIC AXIAL LOAD AND LATERAL PRESSURE,
by C. W. Robinson, Jr. Apr 65, 29p
Contract AT (29-1)-789

Descriptors: (*Cylindrical bodies, Buckling (Mechanics)), (*Loading (Mechanics), Cylindrical bodies).

SLAC-TRANS-16 Field 20C
CFSTI Prices: HC$3.00 MF$0.75
Akademiya Nauk SSSR Institut Atomnoi Energii.
CALCULATIONS OF PULSED MAGNETIC-FIELD COILS,
by L. M. Barkov, V. V. Ogurtsov, and S. Kh.Khakimov. 1964, 62p
Translated from Report IAE-744.

Descriptors: (*Coils, Electromagnetic pulses), (*Magnetic fields, Coils).

SU-IPR-17 Field 20I
CFSTI Prices: HC$2.00 MF$0.50
Stanford Univ., Calif. Inst. for Plasma Research.
STUDIES OF PLASMA OSCILLATIONS.
Quarterly status rept. no. 22, 1 Mar-31 May 65,
by F. W. Crawford. Jun 65, 32p
Contract AT (04-3)-326

Descriptors: (*Plasma oscillations, Plasma physics).

TID-20736 Field 20C
CFSTI Prices: HC$1.00 MF$0.50
Saint Procoplus Coll., Lisle, Ill. Physical Sciences Lab.
AN ANALYTICAL TREATMENT OF A CIRCUIT FOR RATIO AND DIFFERENCE OF CHARGES,
by Francis R. Shonka. 1965, 14p
Contract AT (11-1)-323

Descriptors: (*Electric currents, Circuits), (*Circuits, Electric currents).

TID-21088 Field 20H
CFSTI Prices: HC$1.00 MF$0.50
North Carolina Univ., Chapel Hill.
THE K-SHELL EXCITATION FUNCTION,
by G. S. Khandelwal and E. Merzbacher. 1964, 13p
Contract AT (40-1)-2498

Descriptors: (*Excitation, Functions), (*Atomic energy levels, Excitation).

TID-21548 Field 20I, 20E
CFSTI Prices: HC$1.00 MF$0.50
Westinghouse Research Labs, Pittsburgh, Pa.
PLASMA PRODUCTION.
Quarterly progress rept. for 6 Oct 64-5 Jan 65,
by A. V. Phelps. 15 Feb 65, 5p
Contract AT (30-1)-3472

Descriptors: (*Plasma generators, Lasers), (*Lasers, Plasma generators).

TID-21824 Field 20I, 20E
CFSTI Prices: HC$1.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa. Research Labs.
HIGH TEMPERATURE PLASMAS BY LASER HEATING.
Quarterly progress rept. no. 2, 5 Jan-5 Apr 65,
by A. V. Phelps. 1965, 4p
Contract AT (30-1)-3472

Descriptors: (*Plasma medium, Heating), (*Lasers, Heating).

TID-21850 Field 20L, 20F
CFSTI Prices: HC$3.00 MF$0.75
Vanderbilt Univ., Nashville, Tenn.
OPTICAL CONSTANTS OF EVAPORATED METAL FILMS OF SILVER AND INDIUM.
Master's thesis,
by Russell Henry Huebner. Jun 65, 61p

Descriptors: (*Metal films, Silver), (*Indium, Metal films).

TID-21902 Field 20L
CFSTI Prices: HC$3.00 MF$0.50
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
A SURVEY AND EVALUATION OF THE SEMICONDUCTOR NOISE LITERATURE.
Scientific rept. no. 1,
by T. V. Blalock. 28 May 62, 51p
Contract W-7405-eng-26

Descriptors: (*Semiconductors, Noise (Radio)), (*Noise (Radio), Semiconductors).

TID-21946 Field 20B, 20C
CFSTI Prices: HC$3.00 MF$0.50
Temple Univ., Philadelphia, Pa.
CRYSTAL FIELD EFFECTS IN ZIRCONIUM OXIDE.
Doctoral thesis,
by John Patrick Meehan. May 65, 92p
Contract AT (30-1)-2082

Descriptors: (*Field theory, Crystals), (*Zirconium compounds, Oxides).

TID-22024 Field 20H, 7E
CFSTI Prices: HC$2.00 MF$0.50
Carnegie Inst. of Tech., Pittsburgh, Pa.
NUCLEAR CHEMISTRY RESEARCH OF HIGH ENERGY NUCLEAR REACTIONS, 1964-1965,
by Albert A. Caretto, Jr. 1 May 65, 42p
Contract AT (30-1)-2897

Descriptors: (*Nuclear particles, Nuclear reactions), (*Nuclear reactions, Radiation chemistry).

TID-22045 Field 20I
CFSTI Prices: HC$1.00 MF$0.50
Carnegie Inst. of Tech., Pittsburgh, Pa.
PLASMA RESEARCH.
Progress rept., 1 Apr-30 Jun 65,
by M. F. Hoyaux, G. W. Penney, F. J. Young, andA. Kettani. 1965, 10p EAC-6
Contract AT (30-1)-3100

Descriptors: (*Plasma physics, Instrumentation), (*Plasma sheath, Plasma oscillations).

UCRL-12052 Field 20I
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
NOTE ON ELECTROSTATIC INSTABILITIES IN A PLASMA WITH ANISOTROPIC VELOCITY DISTRIBUTION,
by Yankov Shima and Laurence S. Hall. 4 Aug 64, 7p
Contract W-7405-eng-48

Descriptors: (*Plasma physics, Stability).

UCRL-12383 Field 20H
CFSTI Prices: HC$3.00 MF$0.75
Lawrence Radiation Lab., Univ. of California, Livermore.
COMPARISON OF RECENT PION-NUCLEON PHASE SHIFT ANALYSES,
by L. David Roper. 26 Apr 65, 74p
Contract W-7405-eng-48

Descriptors: (*Pions, Nucleons), (*Phase shift, Nuclear reactions).

UCRL-13147 (pt 2) Field 13A
CFSTI Prices: HC$2.00 MF$0.50
California Univ., Berkeley. Inst. of Engineering Research.
THERMAL STRESSES DURING RAPID TRANSIENT HEATING. PART 2. THERMAL STRAINS IN TUBES DURING TRANSIENT HEATING TO 2000 DEG F.
Final rept., P2,
by J. Frisch and W. H. Giedt. Feb 65, 46p
Contract W-7405-eng-43

Descriptors: (*Pipes, Thermal stresses), (*High temperature research, Pipes).

UCRL-13147 Field 20I
CFSTI Prices: HC$3.00 MF$0.75
California Univ., Berkeley. Inst. of Engineering Research.
THERMAL STRESSES DURING RAPID TRANSIENT HEATING. PART I. HEATING CHARACTERISTICS OF A PLASMA GENERATOR.
Final rept., P1,
by J. Frisch and W. H. Giedt. Feb 65, 60p
Contract W-7405-eng-48

Descriptors: (*Plasma physics, Thermal stresses), (*Generators, Plasma physics).

UCRL-16027 Field 20H
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
ANGULAR CORRELATIONS INVOLVING CONVERSION ELECTRONS,
by T. Yamazaki. Apr 65, 26p CONF-650525-4
Contract W-7405-eng-48
Presented at International Conference on the Internal Conversion Process, Nashville, Tenn.

Descriptors: (*Internal conversion, Electrons), (*Electrons, Internal conversion).

UCRL-16099 Field 20H, 20G, 18D, 9B
CFSTI Prices: HC$3.00 MF$0.75
Lawrence Radiation Lab., Univ. of California, Berkeley.
PHYSIC DIVISION.
Semi-annual rept. for Nov 64-Apr 65.
10 May 65, 71p
Contract W-7405-eng-48

Descriptors: (*Elementary particles, Physics), (*Particle accelerators, Data processing systems).

UCRL-16150 Field 20-, 20M
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
VAPOR PRESSURE AND HEAT OF SUBLIMATION OF CERIUM (III) FLUORIDE.
Master's thesis,
by Mahn Jick Lim. 20 May 65, 26p
Contract W-7405-eng-48

Descriptors: (*Cerium compounds, Fluorides), (*Vapor pressure, Cerium compounds), (*Heat of sublimation, Cerium compounds).

UCRL-16203 Field 20G
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
BEVATRON OPERATION AND DEVELOPMENT. 44.
Quarterly progress rept. for Oct-Dec 64,
by Robert W. Allison, Jr., Kenneth C. Crebbin, William L. Everotte, Fred H. G. Lothrop, and Emery Zajec. 23 Jun 65, 20p
Contract W-7405-eng-48

Descriptors: (*Bevatrons, Particle accelerator techniques), (*Particle accelerator techniques, Bevatrons).

UCRL-7700 Field 20H
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.

CHARACTERISTIC X-RAY PRODUCTION IN THE K-SHELL OF MAGNESIUM AND ALUMINUM BY 25- TO 100keV PROTONS,
by R. D. Worley, D. L. Potter, and J. M. Khan. 13 May 64, 16p
Contract W-7405-eng-48

Descriptors: (*Proton bombardment, Magnesium), (*X rays, Production).

UCRL-7813 **Field 20H**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
COPPER L (III) SHELL X-RAY PRODUCTION BY 25-100 KEV PROTONS,
by D. L. Potter, J. M. Khan, and R. D. Worley. 16 Jun 64, 13p
Contract W-7405-eng-48

Descriptors: (*Proton bombardment, Copper), (*X rays, Production).

UCRL-7953-T **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Purdue Univ., Lafayette, Ind.
AN EVALUATION OF THE DISPERSION RELATIONS OF PHOTOPRODUCTION,
by Paul Finkler. 31 Mar 64, 55p
Contract W-7405-eng-48
Prepared in cooperation with Lawrence Radiation Lab., Univ. of California, Livermore.

Descriptors: (*Nuclear scattering, Photonuclear reactions), (*Photonuclear reactions, Nuclear scattering).

UCRL-7990 **Field 20M**
CFSTI Prices: HC$1.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
TEMPERATURE OF A FLAT PLATE HAVING ALTER- NATING ADIABATIC AND CONSTANT HEAT FLUX STRIPS ON ONE SIDE,
by James H. Van Sant. 27 Jul 64, 10p
Contract W-7405-eng-48

Descriptors: (*Metal plates, Heat transfer), (*Thermal conductivity, Metal plates).

UCRL-8030 **Field 20H**
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Berkeley.
DATA ON PARTICLES AND RESONANT STATES,
by Arthur H. Rosenfeld, Angela Barbaro-Galtieri, Walter H. Barkas, Pierre L. Bastien, and Matts Roos. Mar 65, 37p
Contract W-7405-eng-48

Descriptors: (*Nuclear particles, Resonance), (*Mass spectroscopy, Nuclear particles).

WASH-1056 **Field 20H**
CFSTI Prices: HC$4.00 MF$1.00
Argonne National Lab., Ill.
REPORTS TO THE AEC NUCLEAR CROSS SECTIONS ADVISORY GROUP MEETING HELD AT NATIONAL BUREAU OF STANDARDS, GAITHERSBURG LABORATORY AND ATOMIC ENERGY COMMISSION HEADQUARTERS, MARCH 8-9, 1965,
comp. by A. B. Smith. 1965, 147p EANDC (US)-72-U, CONF-650323

Descriptors: (*Nuclear cross sections, Reports).

WERL-1114-1 **Field 20F, 11F**
CFSTI Prices: HC$2.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa.
INVESTIGATION OF CORROSION FILMS ON INCONEL AND AISI TYPE 304 STAINLESS SL BY TWO NEW TOOLS THE SPINNING-SOURCE MASS SPECTROGRAPH MICROPROBE AND THE SCANNING ELECTRON MICROSCOPE,
by W. M. Hickam, G. G. Sweeney, and W. T. Lindsay, Jr. Jan 65, 28p
Contract AT (11-1)-GEN-14

Descriptors: (*Corrosion resistant alloys, Corrosion), (*Probes (Electromagnetic), Mass spectroscopy), (*Electron microscopes, Corrosion).

Identifiers: Inconel, Stainless steel.

WERL-2989-1 **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Westinghouse Electric Corp., Pittsburgh, Pa. Research Labs.
APPLICATIONS OF THE MOSSBAUER EFFECT IN SCIENCE AND TECHNOLOGY,
by Lawrence M. Epstein. Apr 65, 76p
Contract AT (30-1)-2989

Descriptors: (*Mossbauer effect, Radiation chemistry), (*Spectroscopy, Mossbauer effect).

21. PROPULSION AND FUELS

AD-431 504 **Field 21E**
CFSTI Prices: HC$6.00
Systems Research and Development Service, Federal Aviation Agency, Washington, D. C.
WIND TUNNEL TESTS OF TURBOPROP ENGINE CHARACTERISTICS DURING BIRD INGESTION.
Technical rept.,
by Donald M. Miller. Nov 63, 213p
Proj. SRDS-326-2X
FAA-ADS 2

Descriptors: (*Ingestion (Engines), Birds), (*Turboprop engines, Performance (Engineering)), Wind tunnel models, Model tests, Takeoff, Failure (Mechanics), Operation, Propellers (Aerial).

The results obtained during the test program clearly indicate that multiple bird ingestions can critically affect gas turbine propulsion system operation without causing mechanical damage. Examination and analysis of performance data recorded during the test program resulted in no proposed revisions to the existing test article configuration which could significantly reduce transient effects induced by multiple bird ingestions. During various test runs, it was evident that premature shutdown would be initiated by the propeller autofeathering system. To prevent this, it was recommended that the provision for a time delay in the autofeather system be investigated. An experimental ignition system configuration was evaluated during the test program to determine its effect on engine performance following loss of combustion from a multiple bird-ingestion incident. No evidence was compiled during the test program that this system would alleviate the adverse performance effects induced by a bird-ingestion incident. (Author)

GEMP-342 **Field 21F**
CFSTI Prices: HC$6.00 MF$1.50
General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
630A MARK V MARITIME NUCLEAR STEAM GENERATOR. 630A PROGRAM OPERATION.
Status rept.
26 Feb 65, 231p
Contract AT (40-1)-2847

Descriptors: (*Marine nuclear propulsion, Steam power plants).

LA-DC-6447 **Field 21F**
CFSTI Prices: HC$1.00 MF$0.50
Los Alamos Scientific Lab., Univ. of California, N. Mex.
OCEAN DROP-H20 DENSITY BEHAVIOR IN NUCLEAR ROCKET REACTORS BY FAST GAMMA-RAY TECHNIQUES,
by John D. Rogers, Alfred Bateman and Lawrence Schneider. 1965, 25p
Contract W-7405-eng-36

Descriptors: (*Nuclear propulsion, Space propulsion), (*Rocket propulsion, Nuclear reactors), (*Water, Density).

Identifiers: Kiwi.

Patent 3,216,195 **Field 21H, 20M**
METHOD OF OPERATION OF AN EXHAUST NOZZLE FOR A REACTION ENGINE.
Patent assigned to Navy,
by Edward F. Keon. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Exhaust nozzles, Operation), (*Thermal insulation, Graphite), Rocket motor nozzles, Patents, Thermal conductivity.

An exhaust nozzle for a reaction engine is disclosed wherein at least the inner surface of the nozzle exhibits a high degree of thermal anisotropy. Pyrolytic graphite provides the thermal anistropy. The structure serves to prevent the conduction of heat radially outward from the center of the exhaust stream and dissipates the heat longitudinally of the stream so as to provide effective insulation for control elements such as electrical components.

Patent 3,216,357 **Field 21H, 16D**
THRUST REVERSAL SYSTEM.
Patent assigned to Navy,
by John P. Mertens. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Thrust reverse, Rocket propulsion), Guided missiles, Patents, Thrust vector control systems, Rocket motors, Separation, Stability, Aerodynamic characteristics.

The system is for producing a reversal thrust from the burning gases of a propellant which separates the propulsion unit from the bird without causing any reaction in the bird which would affect its flight by changing its direction or velocity. Individual plugs are provided for each of the reversal thrust nozzles which prevent the entrance of fluid from the outside into the motor chamber but offer slight or no resistance to a pressure directed against the plugs from inside the chamber.

PB-169 052 **Field 21G**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
ENGINE-ROTOR SYSTEM TEST SET AN/USM-202, PART NO. Y63-315880-481-1.
Instrument calibration procedure manual.
15 Oct 65, 17p NAVWEPS-17-20QT-08
PB 168 599 superseded
Rept. dated 15 July 65 superseded.

Descriptors: (*Aircraft engines, Monitors), (*Monitors, Calibration), Test equipment, Target drones, Instruction manuals, Test methods.

The manual contains calibration instructions that will enable calibration personnel to determine whether the equipment is operating within the prescribed specification limitations. It also includes a list of calibration equipment and instructions for the evaluation and recording of data. The Engine-Rotor System Test Set AN/USM-202 PN Y63-315880-481-1, is a portable line maintenance tester which provides test and monitoring functions necessary to test the operation of Navy Model QH-50C Drone engine-rotor system. The Test Instrument consists of five panels, two tachometer-generators, four temperature probes, and the interconnecting cable assemblies.

SC-DC-65-1485 Field 21F, 18C
CFSTI Prices: HC$2.00 MF$0.50
Sandia Corp., Alguquerque, N. Mex.
NUCLEAR EXPLOSIVES--A NEW TOOL FOR THE ENGINEER,
by L. J. Vortman. May 65, 29p CONF-650712-1
Contract AT (29-1)-789
Presented at National Society of Professional Engineers, Alguquerque, N. Mex.

Descriptors: (*Nuclear explosions, Cratering), (*Nuclear engineering, Nuclear explosions).

SC-RR-65-138 Field 21I, 22C
CFSTI Prices: HC$2.00 MF$0.50
Sandia Corp., Albuquerque, N. Mex.
AN APPROXIMATE SOLUTION FOR THE VAPORIZATION OF LIQUID DROPLETS FORMED DURING RE-ENTRY ABLATION,
by R. N. Horton. Apr 65, 21p
Contract AT (29-1)-789

Descriptors: (*Vaporization, Liquid rocket fuels), Atmosphere entry, Ablation.

22. SPACE TECHNOLOGY

MND-3169-67 Field 22B
CFSTI Prices: HC$2.00 MF$0.50
Martin Co., Baltimore, Md. Nuclear Div.
NIMBUS SATELLITE STABILITY STUDY,
by M. G. Scheider. Jun 65, 27p
Contract AT (30-1)-2345

Descriptors: (*Meteorological satellites, Stability).

N65-15053 Field 22D
CFSTI Prices: HC$5.00 MF$1.25
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
AC-4 ATLAS-CENTAUR FLIGHT EVALUATION/ LAUNCHED DECEMBER 11, 1964.
1964, 181p NASA-TM-X-52078

Descriptors: (*Launch vehicles (Aerospace), Flight testing).

N65-15062 Field 22A
CFSTI Price: MF$1.50
National Aeronautics and Space Administration, Washington, D. C.
SEMIANNUAL REPORT NO. 7 TO CONGRESS, JANUARY 1 - JUNE 30, 1964,
by J. E. Webb. 13 Nov 64, 257p
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $1.00.

Descriptors: (*Spacecraft, Reports), (*Space flight, Reports).

N65-15138 Field 22B
CFSTI Prices: HC$1.00 MF$0.50
Goddard Space Flight Center, Greenbelt, Md.
AC DEMAGNETIZATION OF SATELLITE COMPONENTS,
by J. D. Watson. 1963, 7p NASA-TM-X-54944, X-320-63-26

Descriptors: (*Spacecraft components, Degaussing), (*Degaussing, Spacecraft components).

N65-16748 Field 22B, 16D
CFSTI Prices: HC$2.00 MF$0.50
Goddard Space Flight Center, Greenbelt, Md.
INSTRUMENTATION REPORT ON NIKE APACHE FLIGHTS 14.194 CA AND 14.195 CA,
by R. W. Conrad and J. R. Lease. Feb 65, 23p
NASA-TM-X-55125, X-671-64-301

Descriptors: (*Guided missiles (Surface-to-air), Instrumentation), (*Sounding rockets, Instrumentation).

Identifiers: Nike-Apache.

N65-18113 Field 22D, 21I
CFSTI Prices: HC$2.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME I- RP-1 FUEL SYSTEM.
Apr 64, 39p HEC-D042, Vol. 1
Contract NAS8-4016
NASA CR-57077

Descriptors: (*Launch vehicles (Aerospace), Fuel systems), (*Fuel systems, Launch vehicles (Aerospace)).

Identifiers: Saturn (Booster).

N65-18114 Field 22D
CFSTI Prices: HC$3.00 MF$0.75
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-7 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME II-LOX SYSTEM.
Apr 64, 64p HEC-D041, Vol. 2
Contract NAS8-4016
NASA CR-57065

Descriptors: (*Launch vehicles (Aerospace), Liquid rocket oxidizers), (*Liquid rocket oxidizers, Liquefied gases).

Identifiers: Saturn (Booster).

N65-18115 Field 22B, 22D
CFSTI Prices: HC$3.00 MF$0.75
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME II-LOX SYSTEM.
Apr 64, 67p HEC-D042, Vol 2
Contract NAS8-4016
NASA CR-57067

Descriptors: (*Launch vehicles (Aerospace), Liquid rocket oxidizers), (*Liquid rocket oxidizers, Handling).

Identifiers: Saturn (Booster).

N65-18117 Field 22B, 22D
CFSTI Prices: HC$3.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-7 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME IV-NITROGEN AND HELIUM STORAGE FACILITY.
Mar 64, 54p HEC-D041, Vol 4
Contract NAS8-4016
NASA CR-57064

Descriptors: (*Launch vehicles (Aerospace), Design), (*Liquefied gases, Storage).

Identifiers: Saturn (Booster).

N65-18118 Field 22B, 22D
CFSTI Prices: HC$3.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME IV-NITROGEN AND HELIUM STORAGE FACILITY.
Mar 64, 54p HEC-D042, Vol 4
Contract NAS8-4016
NASA CR-57071

Descriptors: (*Launch vehicles (Aerospace), Design).

Identifiers: Saturn (Booster).

N65-18120 Field 22B, 22D
CFSTI Prices: HC$4.00 MF$0.75
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME V-PNEUMATIC DISTRIBUTION SYSTEM.
May 64, 107p HEC-D042, Vol 5
Contract NAS8-4016
NASA CR-57072

Descriptors: (*Launch vehicles (Aerospace), Design), (*Spacecraft components, Pneumatic systems).

Identifiers: Saturn (Booster).

N65-18123 Field 22D
CFSTI Prices: HC$2.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-7 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME VII-LAUNCH PAD ACCESSORIES.
Apr 64, 42p HEC-D041, Vol. 7
Contract NAS8-4016
NASA CR-57068

Descriptors: (*Launch vehicles (Aerospace), Launching).

Identifiers: Saturn (Booster).

N65-18124 Field 22D
CFSTI Prices: HC$2.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME VIII-H-1 ENGINE AND HYDRAULIC SYSTEM.
Feb 64, 29p HEC-D042, Vol. 8
Contract NAS8-4016
NASA CR-57057

Descriptors: (*Launch vehicles (Aerospace), Spacecraft components), (*Rocket motors, Design), (*Hydraulic systems, Design).

Identifiers: Saturn (Booster).

N65-18125 Field 22B
CFSTI Prices: HC$2.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-7 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME IX-RL10A-3 ENGINE AND HYDRAULIC SYSTEM.
Mar 64, 27p HEC-D041, Vol 9
Contract NAS8-4016
NASA CR-57066

Descriptors: (*Launch vehicles (Aerospace), Rocket engines), (*Spacecraft components, Hydraulic systems).

Identifiers: Saturn (Booster).

N65-18126 Field 22B, 22D
CFSTI Prices: HC$2.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME IX-RL10A-3 ENGINE AND HYDRAULIC SYSTEM.
Mar 64, 27p HEC-D042, Vol 9
Contract NAS8-4016
NASA CR-57059

Descriptors: (*Launch vehicles (Aerospace), Rocket engines), (*Spacecraft components, Hydraulic systems).

Identifiers: Saturn (Booster).

N65-18128 **Field 22D**
CFSTI Prices: HC$1.00 MF$0.50
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX, FUNCTIONAL DESCRIPTION- SEPARATION AND FLIGHT TERMINATION SYSTEMS, VOLUME X.
Mar 64, 20p HEC-D042, Vol. 10
Contract NAS8-4016
NASA CR-57074

Descriptors: (*Launch vehicles (Aerospace), Staging).

Identifiers: Saturn (Boosters).

N65-18129 **Field 22D**
CFSTI Prices: HC$3.00 MF$0.75
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-7 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION, VOLUME XI. SUPPLEMENT- LEGEND AND COMPOSITE SCHEMATIC.
May 64, 69p HEC-D041, Vol. 11
Contract NAS8-4016
NASA CR-57076

Descriptors: (*Launch vehicles (Aerospace), Design).

Identifiers: Saturn (Booster).

N65-18130 **Field 22B, 22D**
CFSTI Prices: HC$3.00 MF$0.75
Chrysler Corp., Huntsville, Ala. Engineering Communications Dept.
SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME XI. SUPPLEMENT- LEGEND AND COMPOSITE SCHEMATIC.
May 64, 67p HEC-D042, Vol 11
Contract NAS8-4016
NASA CR-57060

Descriptors: (*Launch vehicles (Aerospace), Design).

Identifiers: Saturn (Booster).

N65-18132 **Field 22B**
CFSTI Prices: HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
COMET AND CLOSE-APPROACH ASTEROID MISSION STUDY. VOLUME 4- SPACECRAFT SYSTEM EVALUATION.
Final rept., 2 Jul 64-2 Jan 65,
by A. Giddis. 2 Jan 65, 24p WDL-TR-2366, Vol. 4
Contracts NAS7-100, JPL-950870
NASA CR-57096

Descriptors: (*Spacecraft components, Tests), (*Comets, Scientific research), (*Asteroids, Scientific research).

N65-18134 **Field 22B**
CFSTI Prices: HC$4.00 MF$1.00
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
COMET AND CLOSE-APPROACH ASTEROID MISSION STUDY. VOLUME 6- TELECOMMUNICATION.
Final rept., 2 Jul 64-2 Jan 65,
by H. Bustamante and W. Slivkoff. 2 Jan 65, 121p WDL-TR-2366, Vol 6
Contracts NAS7-100, JPL-950870
NASA CR-57098

Descriptors: (*Space communication systems, Scientific research), (*Comets, Scientific research), (*Asteroids, Scientific research).

N65-18135 **Field 22B**
CFSTI Prices: HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
COMET AND CLOSE-APPROACH ASTEROID MISSION STUDY. VOLUME 7- POWER.
Final rept., 2 Jul 64-2 Jan 65,
by J. Fairbanks and W. Picciano. 2 Jan 65, 86p WDL-TR-2366, Vol 7
Contracts NAS7-100, JPL-950870
NASA CR-57100

Descriptors: (*Asteroids, Scientific research), (*Comets, Scientific research).

N65-18136 **Field 22B**
CFSTI Prices: HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
COMET AND CLOSE-APPROACH ASTEROID MISSION STUDY. VOLUME 8- THERMAL CONTROL.
Final rept., 2 Jul 64-2 Jan 65,
by M. Cobb, J. Kayne, and D. Newell. 2 Jan 65, 87p WDL-TR-2366, Vol. 8
Contracts NAS7-100, JPL-950870
NASA CR-57099

Descriptors: (*Comets, Scientific research), (*Asteroids, Scientific research), (*Temperature control, Spacecraft).

N65-18137 **Field 22B**
CFSTI Prices: HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SPACECRAFT CONFIGURATIONS. VOLUME 9-COMET AND CLOSE-APPROACH ASTEROID MISSION STUDY.
Final rept.
2 Jan 65, 27p WDL-TR-2366, Vol 9
Contract NAS7-100
NASA CR-57101

Descriptors: (*Spacecraft, Configuration), (*Asteroids, Scientific research).

N65-18256 **Field 22B, 17B**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
DIRECT MICROWAVE TO MICROWAVE TRANSPONDERS FOR COMMUNICATION SATELLITES,
by W. Allen. 15 Sep 64, 11p NASA-TM-X-55133, X-625-64-276

Descriptors: (*Communication satellites (Active), Transponders), (*Transponders, Communication satellites (Active)).

N65-18269 **Field 22B**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
SHADES OF POGO,
by C. Herron and H. Montgomery. Nov 64, 22p NASA-TM-X-55153, X-640-64-349

Descriptors: (*Scientific satellites, Geophysics), (*Geophysics, Scientific satellites).

N65-18270 **Field 22C**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
TRACKING OF A LUNAR TRANSFER ORBIT,
by W. D. Kahn and F. O. Vonbun. Nov 64, 23p NASA-TM-X-55154, X-513-64-353

Descriptors: (*Transfer trajectories, Tracking), (*Tracking, Transfer trajectories).

N65-18526 thru N65-18534 **Field 22A**
CFSTI Price: MF$0.75
National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
TRANSFORMING AND USING SPACE-RESEARCH KNOWLEDGE- TEN DIVERSIFIED VIEWS,
1964, 111p NASA-SP-5018
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.70
Prepared in cooperation with UCLA.

Descriptors: (*Space flight, Scientific research).

N65-20425 **Field 22A**
CFSTI Prices: HC$2.00 MF$0.50
Princeton Univ., N. J. Dept. of Aerospace and Mechanical Sciences.
AEROSPACE PROPULSION SYSTEM AND MISSION ANALYSES RESEARCH.
Status Rept. 1 Feb 64-31 Jan 65,
by J. P. Layton. 15 Mar 65, 33p
Contract NASr-231
NASA CR-57609

Descriptors: (*Propulsion, Spacecraft), (*Astronautics, Scientific research), (*Trajectories, Astronautics).

N65-22569 **Field 22D**
CFSTI Prices: HC$2.00 MF$0.50
Lockheed Missiles and Space Co., Huntsville, Ala. Huntsville Research and Engineering Center.
A COMPARISON OF THE FLOW FIELDS ABOUT THE S-11 STAGE OF THE SATURN V VEHICLE AND SPIKED HEMISPHERE CONFIGURATIONS WITH EMPHASIS ON THE S-11 THRUST CONE HEATING RATES,
by O. R. Pritts. Sep 64, 31p LMSC/HREC-A036515, H-64-009
Contract NAS8-11148
NASA CR-62279

Descriptors: (*Launch vehicles (Aerospace), Flow fields).

Identifiers: Saturn (Booster).

N65-33831 **Field 22B, 5A**
CFSTI Prices: HC$2.00 MF$0.50
National Astronautics and Space Administration, Washington, D. C.
ELECTRICAL POWER MANAGEMENT SURVEY MANUAL.
1 Sep 65, 33p NASA-SP-6007, CM-109-002-1

Descriptors: (*Power supplies, Management engineering), (*Spacecraft, Power supplies).

Identifiers: Apollo.

N65-33845 **Field 22A**
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
LUNAR LANDING AND SITE SELECTION STUDY,
by James L. Lewis and Charles D. Wheelwright. Sep 65, 22p
NASA TN-D-2999

Descriptors: (*Site selection, Lunar bases), (*Lunar bases, Site selection).
Identifiers: Apollo.

206-320 O - 66 - 23

N65-34436 **Field 22B, 5A**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Washington, D. C.
WEIGHT/PERFORMANCE MANAGEMENT SURVEY MANUAL.
15 Aug 65, 34p NASA-SP-6006, CM-017-041-1

Descriptors: (*Management engineering, Spacecraft), (*Spacecraft, Performance (Engineering)).

Identifiers: Apollo.

N65-34438 **Field 22B**
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MEASUREMENTS OF BREMSSTRAHLUNG PRODUCED BY 0.75 AND 1.25 MEV ELECTRONS INCIDENT ON TYPICAL APOLLO WALL SECTIONS,
by Herbert D. Hendricks, Thomas G. James, and Larry B. York. Sep 65, 29p
NASA TM-X-1140
In cooperation with Manned Spacecraft Center, Houston, Tex.

Descriptors: (*Spacecraft components, Bremsstrahlung), (*Bremsstrahlung, Measurement).

Identifiers: Apollo.

N65-34506 **Field 22B**
CFSTI Prices: HC$6.00 MF$1.25
Stanford Univ., Calif.
MAGNETIC ATTITUDE CONTROL OF RIGID, AXIALLY SYMMETRIC, SPINNING SATELLITES IN CIRCULAR EARTH ORBITS,
by Phillip C. Wheeler. Oct 65, 218p
Grant NsG-133-61
NASA CR-313

Descriptors: (*Attitude control systems, Satellites (Artificial)), (*Satellites (Artificial), Attitude control systems).

N65-34575 **Field 22B, 6R**
CFSTI Price: MF$2.50
National Aeronautics and Space Administration, Washington, D. C.
SECOND SYMPOSIUM ON PROTECTION AGAINST RADIATIONS IN SPACE,
by Arthur Reetz, Jr. 1965, 519p NASA-SP-71
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $3.25.
Symp. held at Gatlinburg, Tenn. 12-14 Oct 64.

Descriptors: (*Shielding, Radiation hazards), (*Spacecraft, Shielding).

N65-35476 thru N65-35504 **Field 22A, 17B**
CFSTI Prices: HC$3.00 MF$1.50
Goddard Space Flight Center, Greenbelt, Md.
PROCEEDINGS OF THE APOLLO UNIFIED S-BAND TECHNICAL CONFERENCE, 14-15 JULY 1965.
1965, 312p NASA-SP-87

Descriptors: (*Satellite tracking systems, Lunar probes), (*Lunar probes, Space communication systems), (*Space communication systems, S band).

Identifiers: Apollo.

SC-DC-65-1520 **Field 22C, 11F, 18J**
CFSTI Prices: HC$2.00 MF$0.50
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
DISPERSAL OF REACTOR CORE MATERIALS BY REENTRY PROCESSES.
Quarterly rept.,
by J. L. Beal, W. R. Brown, and R. L. Pleuthner.
Apr 65, 45p
Contract AT (29-1)-739

Descriptors: (*Reactor materials, Reactor cores), (Reactor cores, Reentry vehicles).

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